The New England
Journal of Medicine
Copyright, 1941, by the Massachusetts Medical Society

VOLUME 224 JANUARY 23, 1941 NUMBER 4

HEAD INJURIES*

Observations Based on a Study of 554 Patients

WILFRED PICKLES, M.D.†

PROVIDENCE, RHODE ISLAND

l. 224
941

If thou examinest a man having a gaping wound in his head penetrating to the bone and smashing his skull; thou shouldst palpate his wound. Shouldst thou find that smash which is in his skull deep and sunken under thy fingers, while the swelling which is over it protrudes; he discharges blood from both his nostrils and both his ears and he suffers with stiffness in his neck, so that he is unable to look at his two shoulders and his breast

Thou shouldst say regarding him: One having a gaping wound in his head, penetrating to the bone and smashing his skull, while he suffers with stiffness in his neck.

An ailment not to be treated.

Thou shalt not bind him but moor him to his mooring stakes, until the period of his injury passes by.[1]

THUS wrote a wise and observant Egyptian physician, possibly Imhotep himself, in the earliest known surgical record, well over four thousand years ago. The interest in this striking type of injury has continued through all the years down to the present time. I am accordingly presenting some observations as to treatment based on a study of 554 patients in the Rhode Island Hospital during the past five and a half years.

So far as I can determine, a Rhode Island physician, Henry E. Turner, of Newport, was probably the first to suggest the deliberate opening of the dura in order that the pressure accompanying these injuries might thereby be relieved. In a paper presented to the Rhode Island Medical Society in December, 1861, he[2] reported two severe head injuries: the first to his brother, who had wide laceration of dura and brain, and recovered; the second to a seaman, who had a depressed fracture without injury of the dura, and died. He questioned "whether the penetration of the dura mater . . . did not, in my brother's case, relieve the brain from the pressure, which, in the other case, proved fatal." In the following year, he[3] wrote:

> I have been thus particular in giving an account of this case, as it furnishes a pretty good commentary on the doctrine I ventured, with some hesitation, to enunciate a year ago, that, in severe injuries of the head, perforation of the dura mater improves the prospect of relief and final recovery. . . . I should not feel justified in opening the dura under such circumstances, but I think the question of its propriety worthy of investigation and discussion.

About thirty-five years later, Horsley[4] did have the courage to open the dura deliberately to relieve intracranial pressure, and still later Cushing[5] worked out the technical details that have made subtemporal and suboccipital decompressions such valuable aids in treating diseases within the head.

At the Rhode Island Hospital, patients with head injuries are admitted to the Surgical Service. Such cases comprise a mixed group. Forty-four per cent are due to automobile accidents, 36 per cent to falls, 11 per cent to blows on the head and the rest to various causes, with industrial accidents accounting for less than 2 per cent. These patients are always seen in consultation by the Neurological Service and the Eye Service, and by other services as needed. The treatment that we now follow has thus grown gradually as a result of close co-operation between these departments.

Treatment of head injuries is primarily the treatment of brain damage. Complications such as fracture, hemorrhage and infection may arise and may mask or completely outshadow the injury to the brain, but it is essential that we hold to the general conception of brain damage. This damage, of course, varies within wide limits, and it is convenient to divide it clinically into three syndromes: those of concussion, congestion and contusion. These degrees of damage merge into one another — there is no sharp line of demarcation.

*Presented at the annual meeting of the New England Surgical Society, Poland Spring, Maine, September 27, 1940.

From the Neurosurgical Division of the Surgical Service, Rhode Island Hospital.

†Associate surgeon, Surgical Service, and surgeon, Neurosurgical Division, Surgical Service, Rhode Island Hospital.

Following an injury of the head, the patient with concussion has a loss of consciousness from which he recovers completely. All other findings are normal, there are no neurologic signs, and the evidence given by lumbar puncture is completely negative. Patients with this syndrome have made up 4 per cent of our series.

The patient with congestion has, in addition to his concussion, headache, nausea, vomiting, dizziness, confusion and possibly loss of memory. Lumbar puncture shows elevation of pressure, but the fluid itself is normal. Forty-seven per cent of our patients were classified as in this group.

Contusion is considered to be present when there are added to the signs of congestion evidences of more serious brain damage. There may be coma with loss of sphincter control, respiratory distress, delirium, convulsions and shifting localizations of all sorts. Many of these patients are in shock. Lumbar puncture shows bloody fluid, usually under increased pressure, although this may be lowered by the presence of shock or dehydration. Forty-nine per cent of our patients were thought to have some degree of contusion.

Our aim in treatment is to get the patient at rest with a normal intracranial pressure as soon as this can be done safely. If he is in shock, this must be remedied first of all. Blankets and heaters are used to conserve body warmth, black coffee is given by rectum, and caffeine sodium benzoate is given subcutaneously. The two latter agents serve a double purpose: they not only act as general stimulants but help to control pressure within the head. Handling of the patient is limited as strictly as possible. If clothing is to be removed, this is done gently under blankets. No attempt is made to do a thorough examination or a lumbar puncture or to take x-ray photographs. Lacerations are covered with sterile dressings and their repair left until later, unless hemorrhage has to be checked. And so, with the patient suffering from head injury and shock, we follow the advice of the early surgeon and "moor him to his mooring stakes, until the period of his injury passes by."

When the period of shock has passed, we can begin to make a careful estimate of the extent of the damage to the brain. In addition to the usual clinical chart, an hourly record of pulse and blood pressure is kept, and the fluid intake and output are recorded. A thorough physical examination is made, and lacerations of the scalp are explored with the gloved finger for fracture or depression. A complete examination is made by a neurologist, and the eyes and eyegrounds are examined by an ophthalmologist. Lumbar puncture is next done under complete aseptic precautions, a water manometer being used to record the pressure. Care should be taken to see that the patient's head is not too sharply flexed, since failure to observe this precaution may result in jugular compression, which will raise the intracranial pressure. This will not only give false information but will aggravate the condition for which relief is sought. If the pressure is moderately increased, it is our practice to remove enough fluid to bring it down to a normal level; if it is grossly increased, we bring it about halfway to normal at the first puncture, using further punctures to bring it more gradually to a normal reading. We think that this precaution is of value in avoiding possible further damage from a too-sudden shift in pressure. The frequency with which punctures are done depends on the amount of pressure, the presence or absence of blood and the response to the taps. We have punctured as often as once in six hours when this has seemed necessary. In any case, our aim is to record clear fluid, with cell count, protein and pressure normal at the final puncture. A careful cell count is important, because many fluids reported grossly clear show an appreciable number of red cells when these are counted. If we suspect that a patient has an extradural hemorrhage, we do not use lumbar punctures until after the bleeding has been controlled, since an earlier reduction of pressure may increase the hemorrhage. If the patient has drainage of spinal fluid from the ear, nose or pharynx we are reluctant to use punctures until this stops, because reduction of pressure may result in a reverse flow with a greater possibility of infection. We also believe that the leakage itself helps in reducing the pressure.

As aids in the control of pressure we use careful and moderate dehydration by limitation of fluids, intravenous concentrated glucose solutions and intramuscular magnesium sulfate, bearing in mind that overenthusiasm in the use of any of these methods may bring about a toxic dehydration, and that renal damage may be caused or aggravated by hypertonic solutions. If a combination of all these methods fails to reduce the pressure, subtemporal decompression may be performed; but its results, except when subdural hematoma is present, are disappointing. We think that this method is rarely needed.

Drugs are used sparingly in brain damage. Morphine is not used at all, since it has a real effect in increasing intracranial pressure and depressing respiration. For persistent headache we employ acetylsalicylic acid in combination with caffeine; for moderate sedation, pentobarbital-sodium; and for active delirium, sodium pheno-

barbital intramuscularly or paraldehyde by rectum.

Thus far we have considered the problem of brain damage and its treatment, by far the most important consideration in head injuries. But there are, of course, complications. Fracture of the skull was demonstrated in a little over 25 per cent of the patients in this series; the actual incidence must be considerably greater, since all fractures are not shown by x-ray, and all patients, for one reason or another, are not examined by x-ray. The presence or absence of fracture, except of special types, is usually considered to be of little moment. It is interesting to note that the mortality of patients with fracture was 9 per cent, considerably higher than the mortality for the entire series, which was a little under 5 per cent. Linear fractures of the vault showed a mortality of less than 4 per cent, whereas those of the base showed a mortality of 37 per cent. These fractures call for no treatment other than that of the associated brain damage. Fractures extending into the nasal accessory sinuses are potentially more serious because of the possibility of infection; we had 3 such fractures, but no deaths from this cause. Fractures involving the mastoid carry the same risk; we had 7 such fractures, 3 of them requiring operations on the mastoid, with 1 death. Recently developed drugs are of great value in treating infection coming from this cause; we have had a patient with severe meningitis recover completely following the use of sulfapyridine.

Depressed fractures need operative treatment. When they are compound, their presence can often be made out by the palpation previously advised, and operation is undertaken as soon as shock and brain damage will permit. Thorough débridement and generous flushing of the wound with warm saline solution are of great help in reducing infection. In children the depressed area can often be snapped back into position by means of an elevator introduced through a small drill hole. In older people, the depressed fragments are not infrequently locked. In some cases we have found it possible to free this locking by making a drill hole at the point where the lines of fracture come together; in others, we have gained this end by widening the lines of fracture by the use of DeVilbiss forceps. Free bone fragments are removed, and the resulting bone defect is left for possible later plastic repair. The wound in the scalp is closed without drainage.

Simple depressed fractures can be left for elevation until the patient is in good general condition. Their diagnosis is more difficult, but careful tangential x-ray films are of great help. In our experience, the degree of depression found at operation is almost always greater than the x-ray films indicate. The mortality in simple depressed fractures depends on the underlying brain damage; in our patients with compound depressions it has been 25 per cent.

When a patient after initial unconsciousness clears for a period and then lapses again into unconsciousness, he presents the classic picture of extradural hemorrhage. This is usually due to rupture of the middle meningeal artery or of a venous sinus, and calls for immediate operation. After determination of the side involved, a subtemporal decompression is performed, the clot is removed and the bleeding artery clipped or tied with silk. If this is not possible, the foramen spinosum can be plugged with wood or cotton and the artery thus obliterated. Sinus bleeding can usually be controlled by a muscle patch. If extradural bleeding is the chief injury, the results of the operation are very good, but there is often associated severe brain damage. Our mortality has been 50 per cent.

The existence of a subdural hematoma should be suspected when a patient with head injury not of the overwhelming type fails to improve under the treatment already described; and it is chiefly to the work of Munro[6] that we owe our knowledge of this complication. The diagnosis can be established only by temporal trephine, bilateral if needed. Observation of the dura through such an opening is not enough; the dura is opened and the hematoma is treated by the methods that he has described so well. The mortality of this complication is influenced to a considerable degree by the severity of the brain damage; in our patients it has been 22 per cent.

Summary

Observations are presented on the treatment of head injuries based on the results of a conservative method followed at the Rhode Island Hospital in caring for 554 patients during the last five and a half years, with an operative incidence of 6 per cent, an operative mortality of 29 per cent and a gross mortality of slightly under 5 per cent.

184 Waterman Street

References

1. Breasted, J. H. *The Edwin Smith Surgical Papyrus: Published in facsimile and hieroglyphic transliteration with translation and commentary in two volumes.* Vol. 1. 596 pp. Chicago: University of Chicago Press, 1930. Pp. 158, 159, 161.
2. Turner, H. E. Report on surgery. *Communications Rhode Island M. Soc.* 1:185-195, 1877.
3. *Idem.* Surgical cases. *Communications Rhode Island M. Soc.* 1:197-199, 1877.
4. Horsley, V. On the technique of operations on the central nervous system. *Brit. M. J.* 2:411-423, 1906.
5. Cushing, H. The establishment of cerebral hernia as a decompressive measure for inaccessible brain tumors: with the description of intermuscular methods of making the bone defect in temporal and occipital regions. *Surg., Gynec. & Obst.* 1:297-314, 1905.
6. Munro, D. *Cranio-Cerebral Injuries: Their diagnosis and treatment.* 412 pp. New York: Oxford University Press, 1938.

Discussion

Dr. Donald Munro (Boston): It is gratifying that somebody who has not shown the bad judgment to pin the tag "specialist" on himself has taken up the study of these very common conditions, which, after all, ought to be handled almost exclusively by the general surgeon. I congratulate Dr. Pickles on his mortality figures, and I congratulate you who are here on having had the opportunity to hear such a brilliant and satisfactory presentation.

I am in complete agreement with him except for two points. The first is his additional use of dehydration in the treatment of brain injury. I believe that the use of dehydration in the treatment of brain injury should be limited to the very first part of the treatment, perhaps not extended beyond the first forty-eight hours after the injury; after that the use of dehydration does more harm than good. I am convinced by my experience that the limitation of fluids by mouth, or by any other way, is a mistake, and I have for some years made it a rule that the minimum amount of fluid that an adult patient with a head injury gets is 5000 cc. every twenty-four hours. I believe that less than that is not adequate to care for the fluid needs of such patients.

The second point on which I am in disagreement with him is about irrigation of the wounds in the treatment of compound fractures. I think that the irrigation of wounds in compound fractures of the skull is contraindicated; I never use it. That, however, brings me to a debatable part of the treatment of head injuries, a part that many of the specialists are in disagreement about, and one in which I have very definite and fixed ideas, that is, the problem of when and how to operate on compound fractures of the skull. There is a rather general opinion that compound fractures of the skull are emergencies. My experience and opinion are that they are not emergencies, if you mean by an emergency that the patient must be operated on as soon as seen. I feel very strongly that these patients practically never need to be operated on until such time as you can make your operation an elective procedure. In that event, you have forty-eight hours from the time they are injured until the time they must be operated on.

In support of that viewpoint I invite your attention to the fact that the problem of compound fractures of the skull deals not only with the mortality but also with the morbidity from sepsis after the fractures have been treated. In relation to this I have been using in my clinic the same technic for the last ten years. Everyone who works on compound fractures of the skull in my clinic does every case the same way.

This treatment is always carried out by doing a complete débridement with no local treatment previous to that except for the putting of a dry dressing on the wound. The débridement is done in such a way as to produce an expected healing of the wound by first intention. Unless it does so heal, we class it as septic, even if it merely contains a granulating area. Exception to that is made with cases with frontal-sinus involvement in which the supraorbital ridge has been involved. In such cases the wound is drained.

I have had a total of 176 cases of compound fractures of the skull, 13 of them from bullet wounds and 25 with involvement of the frontal sinus or cribiform plate. Some of these cases have died within twenty-four hours, mostly of surgical shock. In a study of mortality figures, one must consider the incidence of twenty-four-hour deaths, which in this series was 15 per cent. The total mortality for the whole 176 cases was 28 per cent. If we exclude the twenty-four-hour deaths, it was 13 per cent.

One hundred and thirty, or 74 per cent, of these 176 cases were operated on, with a mortality of 15 per cent. A study of the operated cases and the cause of death in relation to the correctness of the technic in operating on them has demonstrated that all but 6 per cent of the deaths were due, or could be traced directly, to faulty technic in the treatment of the wound. I believe that the operative mortality in compound fracture of the skull should not rise above 10 per cent, and may well be brought lower than that.

Thirty-two, or 25 per cent, of the 130 operated cases were septic. By that I mean that the wounds granulated and healed by second intention or that abscesses, osteomyelitis or meningitis developed. If the cases which were septic because of technical errors are excluded, the percentage of sepsis drops to 5 per cent. I think that is probably somewhere near the irreducible minimum that is bound to accompany any method of treating compound fractures of the skull.

These figures are significant because they represent a unified experience with a considerable group, and serve to annotate Dr. Pickles's excellent paper.

Dr. Edward H. Risley (Waterville, Maine): I should like to get an expression of opinion as to the danger or lack of it in doing lumbar punctures in cases which are bleeding. This seems to be an open question.

Dr. Pickles (closing): On the question of dehydration, I apparently did not make myself clear. We attempt it only when other methods fail; that is, when repeated lumbar punctures and ordinary care fail to hold down pressure, we limit fluids and use intravenous glucose and magnesium sulfate. If we use these agents to dehydrate, it seems illogical to push in fluids by mouth at the same time. We do not use dehydration unless we are pushed to that point.

As to the irrigation of wounds, I am afraid that I shall have to differ with Dr. Munro, although his experience is much greater than mine. I have found it a most useful means of converting a dirty, potentially septic wound into one, which can be closed by complete suture and which will heal by first intention.

As regards the use of lumbar puncture when the patient is bleeding, its restriction applies only when we believe that there is a definite extradural hemorrhage; although this may be a theoretical consideration, we still think that it is not necessary, that it does not do any particular good because one is going to operate anyway, and that it may do harm.

ENTEROBIASIS: ITS INCIDENCE AND SYMPTOMATOLOGY IN A GROUP OF 505 CHILDREN*

THOMAS H. WELLER, M.D.,† AND CHARLES W. SORENSON, M.D.†

BOSTON

l. 224
941

THE development of a simple and accurate method for the diagnosis of pinworm infection has made possible valuable additions to our knowledge of the distribution of the parasite, *Enterobius vermicularis*. Accumulating evidence shows that *E. vermicularis* is one of the commonest parasites in human beings in the United States. However, no survey has yet been made to determine its incidence in the New England area, and comparatively little is known about the symptomatology of enterobiasis. This paper presents the results of a study of the incidence and symptomatology of enterobiasis as encountered in a group of 505 children.

METHODS

The study of the incidence was made on a group of 505 white patients from two to twelve years of age at the Children's Hospital in Boston. These children were divided into two groups: 118 patients studied on the medical wards, and 387 patients examined in the Medical Outpatient Department. Consecutive patients were examined without selection as to age, sex or type of illness. Information was obtained regarding the age and sex of each child and the number of persons in his family, the latter being divided into those under fourteen years and those fourteen or over.

Determination of the presence of pinworm infection was made by using the cellophane-tipped anal swab devised by Hall,[1] generally known as the "NIH swab." This swab consists of a small glass rod, over one end of which a one-inch square of cellophane is folded and held in place with a rubber band. For convenience, a one-holed rubber stopper is placed on the other end of the rod, and the swab is thus fitted into a small test tube that serves as a container. In taking the swab the cellophane-tipped end is swept over the perianal skin, with the swab held parallel to the skin to take advantage of the scraping properties of the folded edges of the cellophane. In preparing the swab for examination a drop of N/10 sodium hydroxide is placed on a glass slide, the cellophane-tipped end of the swab is placed in the drop, and the rubber band is pushed up with a pair of forceps, thus releasing the cellophane, which is then flattened on the slide. A cover slip is applied to complete the mount. Microscopical examination will detect the ova among the epithelial debris. Since the female pinworm lays its eggs on the perianal skin, this is the obvious site from which to recover eggs for diagnostic purposes. The NIH swab appears to be a highly efficient and accurate means of carrying out such a procedure. Sawitz et al.[2] found that it was four times as effective as the methods using stool examinations; Faust et al.[3] found it five times as efficient as any other means of diagnosis.

Our swabs were taken between 9:00 a.m. and 5:30 p.m. and examined on the same day. In no case were they taken before the morning toilet —a fact that must be considered in evaluating the results. In 90 unselected cases a second examination was done after an interval of two to seven days. The debris adhering to the cellophane was systematically surveyed, using a magnification of 100; when objects resembling ova were seen, the identification was checked with a magnification of 450. No difficulty was encountered in distinguishing the ova, although ova-like artefacts in the cellophane, such as those described by Reardon,[4] were occasionally seen.

The study of the symptomatology was made on 387 patients seen in the Medical Outpatient Department. Consecutive admissions were surveyed to avoid selection. An arbitrary list of eleven of the signs and symptoms most frequently ascribed to pinworm infection was selected for study. A brief history of the symptoms was taken from the adult accompanying the child. Because none of the patients who came to the hospital complained primarily of pinworm infection, an attempt was made to evaluate the history and to disregard those symptoms for which the primary illness provided an adequate explanation. Information was obtained regarding the past and present history of pinworm infection, after which the perianal region was examined for cutaneous lesions and an NIH swab was taken.

In a group of children who were patients on the medical wards, the blood studies done as a part of the routine medical examination were reviewed to see if there was an eosinophilia. This group

*Contribution from the Department of Comparative Pathology and Tropical Medicine and the Department of Preventive Medicine, Harvard Medical School.

†Formerly, fourth-year student, Harvard Medical School.

was composed of 28 swab-positive and 96 swab-negative children.

Results

Incidence

In the group of 505 children examined, 97 (19 per cent) were found to have enterobiasis. The age and sex distribution of these cases is summarized in Table 1. The relation between the number of children in the family and the incidence of infection is shown in Table 2. An analysis of the data showed that the average number of children under fourteen years of age in the families of the 91 positive cases was 3.1; in the 396 negative cases the average number was 2.2. Additional data showed that for 91 positive cases the average total family size was 5.5 persons, and for 394 negative children 4.6 persons.

Table 1. *Distribution of Enterobiasis by Sex and Age.*

	2–4 Years Old			5–9 Years Old			10–12 Years Old		
	No. of Cases	No. Positive	Per Cent Positive	No. of Cases	No. Positive	Per Cent Positive	No. of Cases	No. Positive	Per Cent Positive
Boys	92	8	9	113	24	21	43	6	14
Girls	78	14	18	128	32	25	51	13	26
Totals	170	22	13	241	56	23	94	19	20

Table 2. *Correlation between the Number of Children in the Family and the Incidence of Enterobiasis.**

No. of Children under 14 Years in Family	No. of Cases	No. of Positive Cases	Per Cent Positive
1	145	13	9
2	159	24	15
3	101	23	23
4	48	18	38
5	19	8	42
6	7	2	29
7	4	1	25
8	3	1	33
9	1	1	100

*Based on a study of 487 children, of whom 91 showed ova.

In a group of 387 children, 42 (11 per cent) gave a history of previous pinworm infection, and of these 16 (38 per cent) proved to be positive on swab examination. In the 345 children with no history of infection, 56 (16 per cent) were positive. With a different form of analysis it was found that in the 72 cases that were positive on swab examination, 56 patients (78 per cent) gave no history of pinworm infection.

Only a small group of children were examined a second time. Thus, of the total series of 505 children, 415 were examined by one swab, of which 74 (18 per cent) were positive; of 90 children examined by taking two swabs, 23 (26 per cent) were positive.

Symptomatology

The study of the symptoms was made on 387 children, 72 (19 per cent) of whom had pinworms, and 315 (81 per cent) of whom were swab-negative. The data on the symptomatology were analyzed in two ways: first, by comparison of the symptoms presented by the positive and swab-negative children (these results are summarized in Table 3 and are discussed below); secondly, the possibility of a correlation between the sex of the patient and the symptomatology was considered in a group of 190 boys, of whom 29 were positive, and 197 girls, of whom 43 had pinworms. This study showed no significant sex variation.

Table 3. *Comparison of Symptoms in the Swab-Negative and Swab-Positive Groups.**

	Swab-Negative Children		Swab-Positive Children	
	No. of Cases	Per Cent	No. of Cases	Per Cent
Gastrointestinal symptoms:				
Present				
Nausea and vomiting	56	18	9	13
Vague intestinal pain	77	24	13	18
Diarrhea	4	1	0	0
Weight loss	12	4	2	3
Loss of appetite	67	21	18	25
Absent	175	56	46	64
Perineal symptoms:				
Present				
Anal pruritus	40	13	12	17
Anal skin lesions	6	2	4	6
Vaginitis and vulvitis	8	3	2	3
Absent	271	86	58	80
Nervous symptoms:				
Present				
Night restlessness	94	30	21	29
Enuresis	40	13	12	17
Masturbation	3	1	3	4
Absent	203	64	42	58
No gastrointestinal, nervous, or perineal symptoms	118	38	26	36

*Based on a study of 387 children, of whom 72 showed ova.

In regard to the relation between the time of day and the intensity of symptoms, 4 of the 315 swab-negative and 3 of the 72 swab-positive patients reported a nocturnal increase in intensity. None of the children gave a history of diurnal increase in symptom intensity. The blood picture was reviewed in 124 patients, 28 of whom had enterobiasis. None of the positive cases showed an eosinophilia of more than 5 per cent.

Discussion

Incidence

Comparatively few reports on the incidence of enterobiasis have appeared in the literature. However, the limited evidence now at hand indicates

that the infection is commoner than has been suspected. The results of the surveys on children in which the NIH swab has been used are summarized in Table 4. Of these, the studies of

TABLE 4. *Studies on the Incidence of Enterobiasis in Children in the United States.*

AUTHORITY	NO. OF CASES	PER CENT POSITIVE	METHOD*	GROUP
Bozicevich[5]	230	31	Single swab	Boys' camp
Cram et al.[6]	524	36	Multiple swab	General population
Bozicevich and Brady[7]	504	57	Multiple swab	Boys' camp
Cram and Nolan[16]	106	55	Multiple swab	Nursery school
Sawitz et al.[2]	131	96	Multiple swab	Charitable institution

*The NIH swab was used in all the studies.

Bozicevich,[5] Cram et al.[6] and Bozicevich and Brady[7] were carried out on patients who were not exposed to the constant opportunities for contact infection that might occur in an orphanage or boarding school; therefore, in this respect their results are comparable to those of the present study. However, in other respects these studies are not comparable with ours, for there are two factors that have probably resulted in our obtaining an infection rate that is misleadingly low. In the first place, the majority of the children were examined by means of only one swab. Cram and Reardon[8] state that at least one swab should be taken on each of four days before negative findings can be considered to represent a probable absence of pinworm infection. Bozicevich and Brady,[7] using this system, found that the first swab detected 68 per cent of the positive cases. In the first place, the majority of the children were the incidence from 18 per cent to 26 per cent. The second factor is that the swabs were not taken at the optimum time for the recovery of pinworm ova, since the examinations were made after the morning toilet had been completed.

In the present series, 23 per cent of the girls were infected, as compared with 15 per cent of the boys. Analysis of these figures shows that this difference is 2.2 times the value of the standard error of the difference of these proportions and is statistically significant. This finding is at variance with that of Cram et al.,[6] who found a slightly higher incidence in males. In comparing age and incidence of infection it was found that enterobiasis was less common in the younger children: 13 per cent of those of two to four years, 23 per cent of those of five to nine and 20 per cent of those of ten to twelve were infected. A statistically significant variation could be established between the two-to-four-year and five-to-nine-year groups, the difference between the proportions being 2.8 times the value of the standard error of the difference. This observation is in accord with the findings of Cram et al.,[6] who noted that the incidence was lower in the preschool group than in children of school age.

The familial nature of enterobiasis is well established, but unfortunately is often ignored when instituting specific therapy. Because of the multiple opportunities for infection and reinfection within the household group, it is to be expected that as the family size increases, thus enhancing the chances of acquiring an initial infection, there should be an increase in the incidence of enterobiasis. Bozicevich and Brady[7] were able to demonstrate a correlation between family size and incidence of infection. In the present study, the average number of children in the households of the positive cases was found to be 0.9 greater than in the households of the negative cases. This difference between the means is 4.8 times the standard error of the difference, and indicates that the incidence is definitely related to the number of children in the family. A similar relation was found to exist when the total family size was considered.

Symptomatology

In the present series, the children with pinworms complained of gastrointestinal symptoms no more frequently than the uninfected children, with the exception of a slight but not significant variation in "loss of appetite." Likewise, vulvitis and night restlessness occurred with the same frequency in both groups. Anal pruritus, perianal skin lesions, enuresis and masturbation were slightly commoner in the positive group, but in no case was the variation statistically significant.

Brady and Wright[9] presented the first statistical analysis of the symptomatology of this disease. They concluded that anorexia, night restlessness and insomnia were the significant symptoms, and found a slight but not statistically significant eosinophilia in the positive group. However, the group studied did not come from the general population but included "persons seeking treatment for known pinworm infestation" and "persons referred because of symptoms suggestive of oxyuriasis." Therefore, their findings are not comparable with those of the present study.

The relatively asymptomatic nature of the infection in the group of children examined in the present study is interesting. It would appear that subclinical enterobiasis is a common condition. Such a conclusion seems to be adequately substantiated by the fact that of the 72 positive cases, 64

per cent had no gastrointestinal symptoms, 80 per cent had no perineal symptoms, 58 per cent had no nervous symptoms and 36 per cent had none of the symptoms in these three groups. Very similar figures were obtained in the negative group.

These findings must not be construed as meaning that the pinworm is incapable of causing symptoms — in the present series 4 cases showed a symptom complex approximating that of the classic description of enterobiasis. However, it is quite probable that at least two factors have combined to overemphasize the importance of symptoms in this disease. In the first place, the symptoms tend to be misleading; they are for the most part so vague that a positive history could probably be elicited from a large percentage of the normal population. In the second place, in the past only those patients showing symptoms have been studied, for the diagnosis of enterobiasis was usually made after investigation of a suggestive train of symptoms. Further work is necessary to determine why some patients have symptoms and others do not. Perhaps factors such as the intensity of infection, the nervous constitution of the infected person and an allergic response to products of the parasite will be found important.

Summary

In a series of 505 white children examined by the NIH swab technic, the incidence of enterobiasis was 19 per cent.

A significantly higher incidence of infection was found among the 257 girls, 23 per cent being positive, as compared with 15 per cent of 248 boys.

In the total series, the incidence in the two-to-four-year group (13 per cent) was significantly lower than that in the five-to-nine-year group (23 per cent).

A significant difference was found between the average number of children under fourteen years (3.1) in the families of the positive cases and that (2.2) in the families of the negative cases; there was a similar difference in the total family size (5.5) of the positive cases and that (4.6) of the negative cases.

Seventy-eight per cent of the positive cases gave no history of previous pinworm infection.

The symptomatology of enterobiasis was studied in a group of 387 children, of whom 72 (19 per cent) had pinworms. Anal pruritus, anal skin lesions, enuresis, loss of appetite and masturbation were slightly commoner in children with pinworms; however, the difference between the incidence of these symptoms in children in whom ova were demonstrated and in those in whom none were found was not great enough to be statistically significant. Nausea and vomiting, vague intestinal pain, diarrhea, weight loss, vaginitis and night restlessness were not found more frequently in the swab-positive than in the swab-negative group.

These results indicate that a large proportion of the cases seen in this group were essentially asymptomatic, and that a condition that might be termed subclinical enterobiasis is relatively common.

References

1. Hall, M. C. Studies on oxyuriasis. I. Types of anal swabs and scrapers, with a description of an improved type of swab. *Am. J. Trop. Med.* **17**:445-453, 1937.
2. Sawitz, W., Odom, V. L. and Lincicome, D. R. The diagnosis of oxyuriasis: comparative efficiency of the NIH swab examination and stool examination by brine and zinc sulfate floatation for *Enterobius vermicularis* infection. *Pub. Health Rep.* **54**:1148-1158, 1939.
3. Faust, E. C., Sawitz, W., Tobie, J., Peres, C. and Lincicome, D. R. Comparative efficiency of various techniques for the diagnosis of protozoa and helminths in feces. *J. Parasitol.* **25**:241-262, 1939.
4. Reardon, L. Studies on oxyuriasis. X. Artifacts in "cellophane" simulating pinworm ova. *Am. J. Trop. Med.* **18**:427-431, 1938.
5. Bozicevich, J. Studies on oxyuriasis. III. The incidence of pinworm infestation in a group of 230 boys in Washington, D. C. *M. Ann. District of Columbia* **6**:239-241, 1937.
6. Cram, E. B., Jones, M. F., Reardon, L. and Nolan, M. O. Studies on oxyuriasis. VI. The incidence of oxyuriasis in 1272 persons in Washington, D. C.: with notes on diagnosis. *Pub. Health Rep.* **52**:1480-1504, 1937.
7. Bozicevich, J., and Brady, F. J. Studies on oxyuriasis. XV. A study of 504 boys in a boys' camp. *M. Ann. District of Columbia* **7**:187-190, 1938.
8. Cram, E. B., and Reardon, L. Studies on oxyuriasis. XII. Epidemiological findings in Washington, D. C. *Am. J. Hyg.* **29**:17-24, 1939.
9. Brady, F. J., and Wright, W. H. Studies on oxyuriasis. XVIII. The symptomatology of oxyuriasis as based on physical examinations and case histories on 200 patients. *Am. J. M. Sc.* **198**:367-372, 1939.
10. Cram, E. B., and Nolan, M. O. Studies on oxyuriasis. XIX. Examinations of children in a private nursery school over an 18-month period. *Pub. Health Rep.* **54**:567-574, 1939.

CONGENITAL ANOMALIES OF THE PELVIC ADNEXA

JOSEPH D. FERRONE, M.D.*

BOSTON

CONGENITAL anomalies are caused by errors in development, and for that reason, any consideration of anomalous structures of the pelvic adnexa may well be prefaced by a brief review of the embryology involved.

In the embryo, the mesonephros is found along the posterior wall of the celom — the future peritoneal cavity. As it develops from its retroperitoneal position it pushes the peritoneum forward, thus forming the urogenital fold, which contains the precursor of the genital gland as well as the wolffian duct and the müllerian duct. The genital gland gradually separates itself by a longitudinal fissure, and after acquiring a mesentery, becomes the testis or ovary. In the female, the retrogression of the wolffian body and duct begins at the seventh or eighth week and continues until nothing but rests remain in the broad ligaments, constituting the parovarium. From the müllerian ducts, however, is developed the entire genital tract to the vaginal introitus. At first the ducts are solid cords; later they invaginate and acquire a lumen. Meanwhile they grow downward until they get below the crest of the ilium, when they turn sharply toward the midline and fuse, forming the uterovaginal primordium.[1, 2] At the end of the fifth month, the fundus of the uterus normally rounds out, so that all appearance of the former double character of the uterine body disappears.[3] The cranial ends of the müllerian ducts form the fallopian tubes, and the open ends develop a series of projections, the fimbriae. The middle and caudal thirds, which have fused, form the corpus of the uterus, the cervix and the upper two thirds of the vagina.

When the caudal ends of the apposed müllerian ducts fail to fuse, one sees, of course, all sorts of malformation, such as uterus didelphys, uterus arcuatus and uterus bicornis.[4] Less often the cranial ends of the ducts fail to develop properly and other anomalies appear. Rudimentary tubes and ovaries are found,[5] or the adnexa may be entirely absent.[5–8] The tube may be a stub at the cornu of the uterus, whereas the ovary may be found anywhere in the pelvic cavity,[9] posterior peritoneal wall, inguinal canal, labia majora[10] or uterine wall.[11]

*Clinical instructor in obstetrics, Boston University School of Medicine; assistant in obstetrics, Tufts College Medical School; assistant in obstetrics, Harvard Medical School, and junior visiting obstetrician, Newton Hospital.

Some interesting theories concerning the evolution of these malformations have been advanced by Masson and Kaump.[4] Their excellent paper includes the following classification of the anomalies of the tubes, ovaries, uterus and vagina.

I. Simple reduplication
   A. Incomplete joining of the müllerian ducts
      1. Symmetrical false reduplication: uterus didelphys
   B. Complete joining of the müllerian ducts
      1. External junction, internal partition: uterus septus duplex

II. Rudimentary development
   A. Aplasia
      1. Incomplete development of both sides (symmetrical)
         (*a*) Absence of tubes, uterus or vagina
      2. Incomplete development of one side of uterus: uterus unicornis
   B. Hypoplasia
      1. Symmetrical or asymmetrical development with hypoplasia or one or more parts

III. Atresia of vagina, cervix or fundus of the uterus

The following case is illustrative of one type of pelvic anomaly.

CASE REPORT

E. E., a 21-year-old, married woman, presented herself in June, 1936, complaining of pain in the lower abdomen, especially on the left side, a sense of pressure on the rectum, dysmenorrhea and menorrhagia. In September, 1934, she had given birth to a premature infant weighing 4 pounds, 4 ounces, who was living and well. One year later she began to complain of pain throughout the lower abdomen, much more marked on the left side, and a sensation of pressure on the rectum. About this time dysmenorrhea developed, and the periods lasted longer than before (6 to 10 days), were more profuse and came oftener.

Physical examination revealed a well-developed and well-nourished young woman. The general examination was not remarkable; there was diffuse tenderness throughout the left side of the lower abdomen, and vaginal examination revealed a multiparous introitus with good support. The cervix had slight bilateral nicks but was otherwise not unusual to touch or sight; the os was closed. The uterus could not be made out clearly. The right vault was normal; in the left vault there was a mass which was spindle-shaped, movable and tender and thought to be either an ovarian cyst or a tubo-ovarian mass. A blood Hinton test was negative, as was a Schwartz–McNeil complement-fixation test.

Under treatment the symptoms were somewhat relieved, although the mass persisted. About one year later, in the spring of 1937, the patient returned complaining that the symptoms were more pronounced. Examination at this

time was essentially the same as that previously recorded, with the spindle-shaped mass persisting apparently unchanged. At that time exploratory laparotomy was suggested.

At operation at the Newton Hospital in August, 1937, the abdomen was opened. Examination of the pelvis revealed a uterus unicornis, which was located in the left side of the pelvis and which, with the left broad ligament and the left tube and ovary, constituted the mass consistently felt on previous examinations. There was no broad or round ligament attached to the right side of the uterus. Above the pelvic brim near the right iliac fossa, partly covered by terminal ileum and cecum, was a rudimentary right tube and ovary; the latter, though smaller than normal, was apparently functioning normally, because there was a corpus hemorrhagicum present. These organs were attached to the posterior peritoneum by a stalk, but the fimbriated end of the rudimentary tube was facing the midline (Fig. 1). The appendix was removed as a routine procedure. To relieve the sensation of pressure on the rectum and the pain in the left lower abdomen, an attempt was made to suspend and straighten the uterus by placing two No. 2 chromic catgut sutures in the corner of the uterus where the right round ligament would ordinarily be situated and, after scarifying that area, by pulling it up to what was thought to be a fairly good position, against the anterior parietal peritoneum and slightly to the right of the midline. The ectopic right tube and ovary were not disturbed.

The patient had an uneventful convalescence, including a normal menstrual period, and left the hospital 16 days following operation; she had been relieved of the sensation of pressure on the rectum. Seven months later after the operation she returned with a complaint of amenorrhea since discharge, and examination revealed that she was 2 months pregnant, despite 7 months of amenorrhea. In October, 1938, she was delivered of a normal baby weighing 7 pounds, 1 ounce, by low forceps after an easy labor of 6 hours. The mother and baby are now well, although the uterus is slightly to the left of the midline.

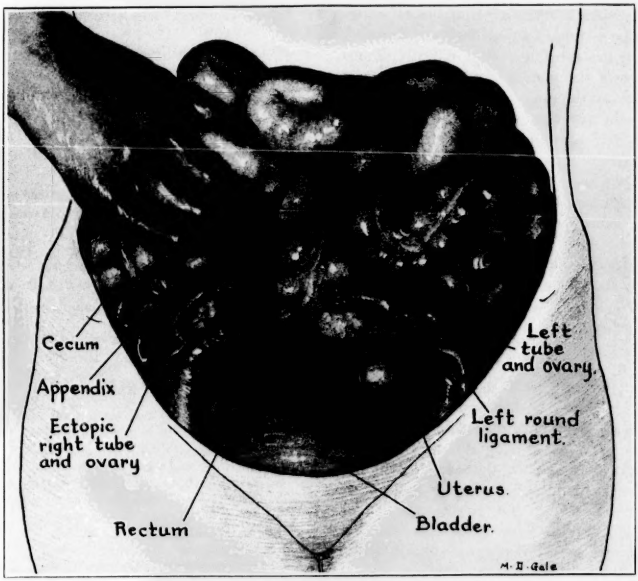

FIGURE 1.

It is extremely difficult to determine or even estimate the frequency of pelvic anomalies in women.[4, 12–15] One thing is certain after reviewing some of the literature: there are few if any cases that are absolutely identical. The commonest types are those involving the uterus itself. Findley[13] in his paper on uterus didelphys quotes other authorities who place the incidence of this abnormality at 1 in 740 women, of which only 3 in 19,000 are recognized clinically. Haynes[14] reports 11 cases, Dannreuther,[12] 13. Masson and Kaump[4] report a number of cases found at autopsy, but do not record how many protocols were examined. However, the congenital anomalies of the organs developing from the cranial end of the müllerian ducts or the genital glands are much less common, as has been previously

mentioned. Mayo and Knepper[5] report 6 cases of congenital anomaly of tube and ovary (either or both) in twenty-seven years of experience. In two, rudimentary tubes were present; in the others, neither ovary nor homolateral tube could be found. White[8] discovered 17 cases of anomaly of tube and ovary in the literature. Others[6,7] report cases of congenital absence of tube and ovary, but Drosin[9] and Mauro[10] bring to light cases of ectopia of these organs. In the 2 cases reported by Mauro the ovary was found in the labium majus. Rudaux and Durante[11] describe a case in which only the histologic examination of the uterus uncovered an atrophic ovary and tube, buried in the uterine wall on the left side. These facts make one wonder whether every reported case of absence was authentic, or whether more extensive exploration would have uncovered these organs. All these writers stress the fact that abnormalities of the kidney and ureter on the affected side are not uncommon; but an intravenous pyelogram taken in the case reported above showed that both kidneys and ureters were present and normal. In an attempt to explain the anomaly herein reported on the basis of the embryology involved, I should say that the uterus unicornis was evolved entirely from the left müllerian duct. The right müllerian duct never succeeded in working its way caudad to join its partner, but its cranial end continued to develop, resulting in a rudimentary, ectopic right tube and ovary.

An analysis of the records at the Newton Hospital from 1923 to the present reveals that a diagnosis of double uterus was made in 2 cases, that of bicornuate uterus in 1 and that of absence of the fallopian tube in 1. In the latter case, to quote from the operator's note: "The fundus lay to the right of the pelvis. The right tube and ovary showed no abnormality. There was no left tube, and the left ovary was high on the left pelvic wall. A semblance of broad ligament extended from the ovary to the level of the internal os, where a very rudimentary round ligament could be made out. Nothing could be found which represented a rudimentary tube."

The records of the Boston City Hospital were reviewed from 1915 to the present with the following results: the diagnosis of double uterus was made in 9 cases; that of bicornuate uterus, in 7; that of septate (or double) vagina, in 5; and that of congenital anomaly of the tubes and ovaries, in 4. An analysis of the last 4 cases revealed the following: in one no pelvic organs were found (there was a vagina but no uterus, tubes or ovaries); the second had a congenital absence of the left ovary and a rudimentary left tube; the third was the same as the second except that a nodule the size of a lima bean was excised from the left posterior peritoneal wall and the pathologist reported it to be a normally functioning ovary; the fourth had a congenital absence of the right appendages, a uterus unicornis and a pelvic right kidney. An attempt to estimate the frequency of these abnormalities from the above figures might lead to erroneous conclusions.

The chief points of practical interest are: Can diagnoses of pelvic anomalies be made in advance and if so, how? What is the proper treatment? Most women who have such anomalies lead a perfectly normal existence, except when the vagina is involved. The history alone is not very helpful; pelvic pain, menorrhagia, metrorrhagia, alone or in combination, are frequent complaints. Undoubtedly some abnormalities can be suspected and perhaps even diagnosed at the time of a pelvic examination, particularly the reduplicating forms. If an abnormality is suspected at this point, a hysterosalpingogram should be done, provided there is no contraindication to it. Despite all this, the type of abnormality here reported has practically always been discovered accidentally or incidentally. Absolute conclusions cannot be drawn from the literature. The weight of opinion leans toward the belief that some of these patients show less tendency to become pregnant than normal women do, but that once they have become pregnant, that difference is no longer present. The type of operation, then, that seems indicated is the most conservative surgery consistent with the relief of the symptoms. Each case must of necessity be judged on its own merits; and, by virtue of the very nature of the anomaly described, no standard technic can be advocated. The patient in this case was relieved of her distressing symptoms and also was able to procreate after, as well as before, operation.

Summary

A case of congenital anomaly of the pelvic adnexa is reported.

A brief review of the embryology of the female genital system is presented.

The literature on this condition is reviewed.

The cases of congenital anomaly of the adnexa that have been reported have been discovered accidentally or incidentally; the patients have been operated on for pelvic pain, for menorrhagia or metrorrhagia or both and in no two cases have the findings been identical.

Conservative treatment often relieves the symptoms and preserves the functions of menstruation and procreation.

99 Bay State Road

References

1. Jordan, H. E. and Kindred, J. E. *A Textbook of Embryology*. 613 pp. New York: D. Appleton-Century Co., 1926. Pp. 265-311.
2. Bremer, J. L. *Text-book of Histology: Arranged upon an embryological basis*. Fifth edition. 580 pp. Philadelphia: P. Blakiston's Son & Co., 1936. Pp. 417-421.
3. Graves, W. P. *Gynecology*. Fourth edition. 1016 pp. Philadelphia: W. B. Saunders Co., 1928. P. 549.
4. Masson, J. C. and Kaump, D. H. A review of seventeen cases of interesting anomalies of the female genital tract. *Am. J. Obst. & Gynec.* **33**:566-576, 1937.
5. Mayo, C. W. and Knepper, P. A. Congenital unilateral absence of tube and ovary. *Proc. Staff Meet., Mayo Clin.* **12**:523, 1937.
6. Björkenheim, E. A. Einseitiges Fehlen des Ovariums und der Tube. *Zentralbl. f. Gynäk.* **59**:794-796, 1935.
7. Mishell, D. R. Unilateral absence of the fallopian tube and ovary. *Am. J. Obst. & Gynec.* **36**:705, 1938.
8. White, C. P. Congenital absence of left tube and ovary: report of case. *Illinois M. J.* **68**:536-538, 1935.
9. Drosin, L. Aberrant ovary and malformed tube seen in operation for ectopic pregnancy. *M. Rec.* **141**:95-97, 1935.
10. Mauro, M. Contributo allo studio della ectopia e dell'ermia inguinale dell'ovaio. *Arch. di ostet. e ginec.* **41**:713-756, 1934.
11. Rudaux and Durante. Un cas d'utérus gravide sans annexes apparentes. *Bull. Soc. d'obst. et de gynéc.* **14**:639-644, 1925.
12. Dannreuther, W. T. Uterus duplex unicollis: with comments on malformations of the uterus. *Am. J. Obst. & Gynec.* **14**:376-379, 1927.
13. Findley, P. Pregnancy in uterus didelphys. *Am. J. Obst. & Gynec.* **12**:318-325, 1926.
14. Haynes, L. W. Uterus duplex. *Am. J. Obst. & Gynec.* **25**:604-606, 1933.
15. Smith, F. R. The significance of incomplete fusion of the müllerian ducts in pregnancy and parturition, with a report on thirty-five cases. *Am. J. Obst. & Gynec.* **22**:714-728, 1931.

PHYSIOTHERAPY IN RHEUMATOID ARTHRITIS*

WILLIAM A. ELLISTON, M.D.,† MARIE F. SILBER, R.P.T.T.,‡ AND DOROTHY GROVER, B.S.ED., R.P.T.T.§

BOSTON

A RECENT health survey of chronic disease in a large cross-section of the population of this country by the United States Public Health Service‖ shows that "rheumatism ranks first in prevalence, second both in producing chronic disability and in invalidity (permanent disability) and fourteenth in causing death." Rheumatoid arthritis causes a large proportion of this disability, and if untreated follows a relentless course.

The proper treatment of rheumatoid arthritis can and should be undertaken with optimism, but such treatment is of long duration and varies greatly with the individual patient. Physiotherapy is of paramount importance in all stages of the disease and is the leading factor in preventing chronic disability.

For ten years the physiotherapy program at the Robert B. Brigham Hospital has been continuously revised and improved on the basis of sound physiotherapy principles. Trial, then discard or inclusion, of countless procedures has resulted in our present methods; it is the purpose of this paper to present them.

Posture Training

Training in body mechanics is of primary importance so that patients may develop a kinesthetic sense and form good postural habits. Faulty body mechanics produces undue strain, with resulting tendency to deformity of the joints, as well as disturbances in the respiratory, circulatory and digestive systems. If this condition is not corrected, it may contribute to a recurrence of joint symptoms due to strain and incorrect use, especially in the lower extremities when weight-bearing is resumed.

Positions

In conjunction with training in posture, patients are placed in a hyperextended position for half-hour periods after meals. A pillow is placed under the dorsal spine and another under the knees, and the arms are extended over the head in a restful position. This brings about, as nearly as possible, the ideal weight-bearing posture, even though the patient may be forced to remain supine. Often there are patients who, because of marked kyphosis, must begin taking these positions without a pillow under the spine. No final statement can be made, therefore, as to the exact position during hyperextension and postural exercises, since adjustments must be made according to the deformities present in each case.

Exercises

Postural exercises in the supine position are explained as soon as patients are admitted to the hospital. They begin with the teaching of the correct use of the body, and the ability to maintain a position of rest without strain; for rest, in the best physiologic position, is an essential aid to recovery. The patients lie on their backs with the cervical spine extended and the arms, with elbows flexed, abducted to as near 90° as possible. This allows for a better chest position during the exercises. For teaching purposes we have found it beneficial for the physiotherapist to indicate to the patient with her hands where the muscle activity should take place. This eliminates repeated explanations and aids the patient in developing muscle sense.

*From the Orthopedic Service of the Robert Breck Brigham Hospital.

†Assistant in orthopedic surgery, Harvard Medical School; instructor in orthopedic and fracture surgery, Boston University School of Medicine; visiting orthopedic surgeon, Robert Breck Brigham Hospital.

‡Director of physical therapeutics, Robert Breck Brigham Hospital.

§Assistant in physical therapeutics, Robert Breck Brigham Hospital.

‖*The Magnitude of the Chronic Disease Problem in the United States*. 19 pp. National Health Survey No. 6. Washington, D. C., National Institute of Health, 1939. P. 2.

The first postural exercise is one of simple breathing, concentrating on an expansion of the upper chest as the air is taken in. At the same time the abdominal muscles must be kept contracted to eliminate abdominal breathing. This contraction is held until the air is expelled. In the second exercise the patient is taught to localize the breathing in the middle and lower chest. He inhales as in the previous exercise, contracts the abdominal muscles and maintains the lift of the upper chest while taking series of breaths at the region of the diaphragm, thus causing a lateral spread of the lower ribs. We do not advise advancing a patient to this exercise until he has thoroughly mastered the first one. The third exercise is the so-called "rib stretch." Normal breathing is resumed, the chest is kept in a relaxed position, and the abdominal muscles are slightly contracted to keep the pelvis stable as the patient attempts to elevate the ribs, alternately to the right and left. The value of this exercise is lost if lateral flexion of the dorsal spine or elevation of the shoulders takes place. The fourth and last exercise is the so-called "pelvic tilt." Breathing is continued at a normal rate with the chest in a relaxed position. The abdominal muscles are contracted without causing tension on the thoracic muscles. Simultaneously the patient contracts the gluteal muscles, attempting to flatten the back against the bed. These exercises can be continued even when the extremities are immobilized.

Following a period of complete bed rest, these exercises are repeated with the patient sitting on the side of the bed. This procedure teaches control of muscles against gravity and serves as a transition from the lying to the standing exercises.

To perform these exercises standing, the patient assumes a position with his back against the wall. The heels should be 4 inches away from the wall, hips and shoulders touching and chin in. When the patient learns to balance the body correctly without support, the final stage of posture training is reached: that of the proper mechanics of walking. This is a new procedure for arthritic patients who have not walked for a long time, and it therefore requires careful and prolonged supervision.

The exercises are supervised twice a week by the physiotherapists, and the patients are instructed to repeat them three times daily. Each exercise is done five times at first, and the number is gradually increased to a maximum of ten.

Active Muscle and Joint Exercises

Static Exercises

Before the joints are splinted during the acute stage of the disease, it is essential that the patient be taught the value of keeping up muscular nutrition and tone through the medium of muscle-setting exercises, especially of the quadriceps and the gluteals. Since muscle setting does not involve joint motion, pain or damage to the joints is not increased. The patients are shown this method of exercise immediately following admission, and continue with it while confined to solid casts or until the acute condition within the joints has subsided. We cannot stress enough the importance of obtaining the full co-operation and understanding of the patients in this matter. Without the strength maintained through repeated muscle-setting exercises, it is more difficult to progress to exercises involving joint motion.

Free Exercises

Joint exercises should be begun as soon as any degree of painless motion is possible. They are aimed at securing increased flexibility of the joints and improving muscle strength. All exercises for the extremities are done in the lying position, since thus a minimum of effort is required. The motion should be confined so far as possible to one joint of the arm or leg.

Shoulder. The tendency of the arthritic patient is to use the entire shoulder girdle when exercising the arm; therefore we prefer bilateral performance in shoulder and elbow exercises. The pull of gravity is partially overcome if the elbows are kept in a flexed position while the shoulders are exercised in the anteroposterior and lateral planes. When muscle strength becomes sufficient to raise the arms with elbows extended, circumduction, beginning with a forward and upward pull, replaces the previous exercises. Free range of motion is permitted because fatigue and discouragement will arise if too much stress is put on the use of specific muscle groups to bring about the desired action.

Elbow. In exercising the elbow, the arthritic patient habitually eliminates supination and pronation. We have seen an increase in the tendency to subluxation in the elbow joint when these motions are not properly combined with flexion and extension.

Wrist and hand. Active exercises of the wrist and hand are seldom prescribed when ulnar deviation or flexion deformity is present, since it would be impossible for the patient to maintain a position beneficial for exercise. However, following manipulations when a corrected position has been obtained, flexion or extension exercises are taught as indicated by the degree of correction.

Hip. Owing to the inability of patients to lie

prone, hip-extension exercises are comparatively ineffective. We compensate for this by giving exercises in the hydrotherapy tank or by using elastic traction (Fig. 1). It is seldom necessary to in-

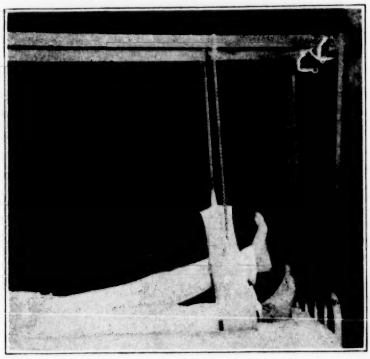

FIGURE 1.

struct patients in hip-flexion exercises because of the flexibility obtained from the position assumed at mealtimes and during recreation.

Knee. As a variation of the quadriceps-setting exercise, an attempt is made to lift the heel off the bed without raising the thigh. This exercise is possible only for those patients who are able to extend the knee fully. Knee extension against gravity is given as the strength in the quadriceps muscle increases and the patients become able to assume a sitting position. Performed in this way the common error of substituting hip flexion for quadriceps contraction is largely avoided.

Ankle and foot. To help in overcoming functional deformities in the foot, routine exercises are prescribed. Flexion and extension of the ankle are practiced for flexibility, and if performed slowly will aid in increasing muscle strength. The combined motions of plantar flexion, inversion and dorsal flexion, with emphasis on the inward and upward pull, are beneficial to the tarsal arch. When flexing the toes to improve the strength of the intrinsic muscles of the foot, the patient is told to maintain as great a degree of dorsal flexion of the ankle as possible.

During the patient's stay in the hospital, all active joint exercises are carried out three times daily. Each exercise is done only a few times at first, and the repetitions are gradually increased according to the muscle strength gained. The exercises are supervised by the physiotherapists twice a week, at the time when the postural exercises are checked.

Assisted Exercises

The improvement of patients with marked muscle atrophy is more rapid if they are assisted in some of their exercises. This applies particularly to leg exercises, which are simplified by the use of elastic traction. This consists of a wide, felt-lined canvas cuff suspended by a cable elastic from overhead frames. The cuff, which is placed just above the ankle, is sufficient to eliminate the friction of the bed in lateral hip motions and to offer enough resistance to overcome the pull of gravity in hip extension (Fig. 1). It may also be employed to encourage knee activity, when it should be placed just below the knee. Both legs are drawn up, and extension is attempted with each leg alternately; this is shown in Figure 2, in which only the right knee is flexed. Care must be taken that the hip is held stationary as the knee is extended; otherwise the patient may institute hip motion, which, modified by the elastic traction,

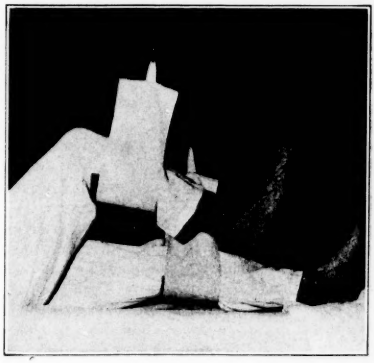

FIGURE 2.

will give flexion and extension of the knee without contraction of the quadriceps muscle.

Another method of aiding muscle function is by underwater exercise. Its value lies not only in the supporting action of the water and the relaxation gained through increased body warmth, but also in the encouragement given to the semihelpless patient.

Restricted Exercises

As active motion becomes freer, it is necessary to restrict undesired movement by supporting, in a

correct position, the part to be exercised, as, for example, by stabilizing the shoulder girdle while shoulder exercises are carried out. In treating elbows following operation for arthroplasty, it is essential to give the same type of assistance, holding down the shoulder as the elbow moves. Previous to an arthroplasty for relief of ankylosis in the elbow joint, the patient has been accustomed to using the arm as a whole; it is the duty of the physiotherapist to help him overcome this habit.

Before he can exercise the hand properly, it is necessary to eliminate deformities that can be corrected passively. The commonest of these are ulnar deviation and subluxation of the metacarpophalangeal joints. To maintain proper alignment of the bones, so that the maximum pull of the muscles may be obtained, pressure is exerted along the ulnar border and under the metacarpal heads. With this support the muscles contract to better advantage, or if subluxation is overcome, are restored to their normal course with a minimum of joint strain.

It is rarely necessary to stabilize the pelvis during this type of hip exercise. If the opposite leg can be abducted, the weight of the leg and pelvis is sufficient to hold the body so that motion occurs in the hip joint alone. An exception occurs in underwater exercises, in which the movement tends to be along the path of least resistance and the patient substitutes activity in the lumbar spine to compensate for the limited hip motion.

In those joints in which two muscle groups work simultaneously, support must be given to the moving part to stop motion of the undesired muscle group; for example, in abduction of the hip, rotation must be guarded against. Such lack of co-ordination is particularly evident following an arthroplasty or osteotomy.

Resisted Exercises

It is not usually our custom to offer resistance in joint exercises, owing to the tendency toward subluxation of the joints. Although such exercises are beneficial to the musculature, they are detrimental to a joint when its structure is impaired. Resistance to the exercises may be offered in cases in which a joint has been only mildly involved and there is, except for muscle atrophy, a complete return of function.

Forced Motion

Joint Stretching

Regardless of the amount of active exercise that a patient can perform, the range of free motion in a joint is limited by adhesions and contractures. Therefore, when the disease becomes quiescent and the joint symptoms subside, it is necessary to stretch the fibrous adhesions. A standardized procedure is essential in order that the patient may know what to expect. The process is at best painful, and increased spasm and contracture, due to fear, must be avoided. As patients become accustomed to one method of treatment they become less apprehensive and can concentrate on relaxing. Traction must be applied when stretching arthritic joints, to relieve friction within the joints and to avoid the possibility of fracture. The patient's tolerance will not permit more than three or four stretchings at a time in any one direction. Pain is lessened if a few strokes of massage are interspersed with the exercises. The process should seldom be repeated more than three times a week, except for the postoperative cases, which should be treated daily. If increased stiffness results and constant pain persists, treatment should be discontinued.

Shoulder. The first consideration in exercising the shoulder is stabilization of the acromioclavicular joint. The physiotherapist places one hand firmly over this articulation, but in a position that will not interfere with the larger tubercle of the humerus; the other hand is placed over the posterior aspect of the humerus a few inches below the glenoid. At the termination of the arc of active motion, it is necessary for the patient to relax completely, so that traction may be applied at this point; it must be maintained throughout the stretching process. Care should be taken to equalize the force between the downward pressure on the shoulder girdle and the upward lift of the humerus. We cannot specify the degree of increased motion that can be obtained, since this will vary with individual cases and according to the amount of destruction within the joint. Flexion and extension must take place in the direct anteroposterior plane, with precautions against rotation of the humerus. If the rest of the arm is involved, support should be given to the elbow and wrist. To eliminate all strain the stretching process must be confined to one articulation at a time. Abduction may be assisted in the same manner without altering the position of either the patient or the physiotherapist. The motion must not be carried beyond the 90° angle, because motion above that point will involve the whole shoulder girdle. Owing to the possibility of fracturing the surgical neck of the humerus, stretching in inward and outward rotation is not advisable unless the patient can abduct the arm to shoulder level. In such cases the elbow is flexed to a right angle, and

traction is applied to the humerus. With the traction held firmly there will be no elevation of the shoulder girdle; this eliminates the necessity of holding down the acromioclavicular articulation. The traction can be maintained and at the same time pressure exerted on the forearm, stretching the shoulder in inward and outward rotation (Fig. 3). It usually follows that adhesions

FIGURE 3.

are no longer present when the shoulder can be fully rotated outward, that is, the arm placed in the aforementioned position with the dorsal surface of the hand and the entire forearm in contact with the bed.

Elbow. For stretching the elbow joint the arm is brought in close to the side. To avoid pressure of the elbow against the bed, the physiotherapist places one hand under the arm and in this position firmly grasps the humerus at the level of the condyles; the other hand, which will supply the traction, grasps the forearm near the joint. This traction must be applied equally on both radius and ulnar, for an unequal pull will so affect the alignment of the bones that injury to both elbow and wrist may result. Supination is attempted simultaneously with flexion. When stretching in the combined motions of extension and pronation, if limitation is slight it is well to change the hold on the forearm to an overhand grasp; this releases pressure on the muscles and eliminates pinching of the skin. Relaxation of the shoulder must be maintained throughout this procedure, since there is a tendency to compensate for lack of elbow extension by raising the shoulder joint.

Wrist and hand. Adequate traction is difficult to apply in the wrist, owing to the arrangement of the carpal bones. The factors for consideration are an increase in the flexibility of the joints and the stretching of the carpo-ulnaris muscles. This is best accomplished by placing the supporting hand just above the wrist against the radial border of the forearm and the stretching hand just below the wrist against the ulnar border of the hand, with the fingers around the parts parallel to the wrist joint. Because of the disagreeable sensation caused, it is well not to exert extreme pressure over the radial artery.

The metacarpophalangeal joints should be stretched individually. Pressure is exerted on the palmar surface of each metacarpal head to restrict motion in the carpometacarpal junction. Traction is maintained on the adjacent proximal phalanx, with the fingers holding the lateral aspect, close to the joint. This position allows for free movement of the tendons that cross the dorsal and palmar surfaces of the articulations. All interphalangeal joints are stretched in like manner. It is of the utmost importance that these small joints be stretched with a short leverage, since there is constant danger of fracture, owing to the bone atrophy so often present.

Hip. Satisfactory stretching of the hip joint cannot be executed by one physiotherapist alone. The pelvis must be stabilized bilaterally to provide countertraction to offset the amount of traction applied. The lower leg should be supported, and all traction must be applied above the knee. This requires the combined efforts of two physiotherapists; one stabilizes the pelvis, while the other applies the traction, assists with the motion and at the same time eliminates rotation of the femur. This technic is particularly valuable following arthroplasties of the hip, and should be carried out daily over an extended period of time. Following surgical operations on the hip joint, patients are able to do muscle-setting exercises, but because of the weight of the femur and the temporary damage to muscle fibers, active motion is slow to return. Therefore, to maintain mobility of the hip joint, assistance must be given. As pain and muscle spasm subside, motion may be increased by careful stretching. When weight bearing is resumed, there is a tendency toward contraction of the tissues that necessitates an increase in the amount of traction as the joint is stretched.

Knee. This joint is extremely susceptible to damage if stretched improperly. Its structure is such that subluxation may easily occur or increase unless a short leverage is used with traction equally distributed on the tibia and fibula, avoiding outward rotation. Of relative importance in stretching the knee is the position of the hip joint. In stretching a flexion deformity no motion should occur in the hip. Therefore, the hip must remain semiflexed throughout the process. The hand supplying the traction on the lower leg exerts pressure upward under the calf. The other hand, placed over the femoral condyles, exerts downward force to equalize the pressure and steady the femur.

When marked flexion deformity is present, every effort is made to reduce posterior subluxation of the tibia as well as to decrease the angle of deformity. During the process of stretching, constant attention is given to hold the improved alignment of the bones while an increase in the mobility of the joint is attempted. Following operative procedures or extensive treatment in solid casts, it may be necessary to assist patients to regain flexion of the knee. It must be borne in mind that the end result should include ability to perform complete extension while retaining as much power of flexion as possible. If the hip can be flexed, a more effective stretching in knee flexion can be accomplished, with less risk to the femur owing to relaxation of the rectus femoris muscle. We believe that this undesired position of hip flexion is held so briefly that it is offset by the gain to the knee.

Ankle and foot. Owing to the general structure of the ankle, it is unwise to apply traction when giving assistive exercises, since too much strain on the ligaments results. The ankle may be forced in either plantar or dorsal flexion according to the deformity present, and so far as possible eversion should be eliminated. The latter position is often associated with peroneal spasm, so that stretching should be used as a preliminary to immobilization in casts. Limitation of motion in the tarsometatarsal joints is usually present with the common deformity of valgus. This deformity requires careful and selective stretching in inversion, with the foot supported in a neutral position.

The metatarsophalangeal joints are stretched in flexion with a technic identical to that used on the corresponding joints of the hand. The foot is held in dorsiflexion and ample support is given under the metatarsal heads, while each toe is stretched separately. If hallux-valgus deformity is present it will cause considerable disorganization of the metatarsophalangeal joints. Therefore, stress must be placed on correct alignment of the bones during the stretching process.

The force of gravity may sometimes be used to help increase joint motion, although it is seldom sufficient to overcome the strength of muscle spasm or the adhesions present. However, in some cases gravity can be used to help patients increase the flexibility of their own joints, for example, dangling their legs over the side of the bed to regain knee flexion.

Manipulation

This method of forced motion is classified as a surgical procedure. Joints are manipulated under anesthesia by the surgeons and supported in the improved position, and mild physiotherapy is immediately resumed to prevent recurrence of adhesions.

Passive Movement

The use of passive movement in the treatment of rheumatoid arthritis is limited. It would be well if joints in the active stage of arthritis were put through their full range of painless motion every day. However, if patients are unable to perform any active motion without pain, they usually experience pain at the slightest attempt at passive movement, and muscle spasm will increase.

Massage

It should be remembered that although massage is contraindicated over acute joints, it need not be avoided on related musculature. We have found that the arthritic patient responds better to a slow, relaxing massage than to a rapid, stimulating treatment. With this in view, we limit our technic to effleurage and pétrissage. Because of the sensitivity of arthritic joints, the part under treatment should be well supported to avoid any undue jarring or motion.

Heat

Baking or massage may be used to aid relaxation before exercise. The 250-watt Thermolite and single-unit infra-red lamps are used interchangeably for the baking treatments.

For application of moist heat, one or more of the following methods are used: vapor baths and fomentations. Vapor baths are given biweekly. The patient is placed in a recumbent position, and the entire body, with the exception of the head, is treated. The treatment is given for twenty minutes at a temperature sufficiently high (105 to 115°F.) to aid in relaxation and produce relief of pain. Vapor baths should activate the sweat glands but not exhaust the patient. If fatigue is evident, the treating time should be shortened and the temperature lowered. Hot fomentations are applied daily to affected joints and have a local effect similar to that of vapor baths.

Applications of hot paraffin to the hands and feet are another phase of the daily routine. The paraffin is melted and brought to a temperature of approximately 125°F. The affected extremities are repeatedly immersed in the liquid wax until they are well coated. They are then wrapped in a piece of rubber sheeting, and the wax is kept on for fifteen or twenty minutes. This produces

a marked hyperemia and aids in the reduction of pain.

Follow-Up Procedure

Although not a form of treatment, photography for record purposes is an important part of our follow-up work. This procedure is undertaken by the Department of Physical Therapy. Photographs are taken of all patients on admission, previous to and following operations, and at varying intervals when they return to the clinic. These photographs consist of anterior, posterior and lateral views of the standing position of ambulatory patients and of views of the characteristic lying position of nonambulatory patients. Photography of visible deformities and composite pictures showing limited joint motion are of great value in following the patients' progress.

Following discharge from the hospital continued encouragement and supervision are given to these arthritic patients under the direction of the Home Service Department. Arrangements are made for patients to attend home-service clinics, and a complete survey is made of all outlined treatments that the patients have been directed to follow at home. The physiotherapist reviews all exercises and makes necessary corrections or additions.

Summary

The program of physiotherapy for arthritic patients now in use at the Robert B. Brigham Hospital is discussed. Details of the technics used are given from the viewpoint of a physician-in-charge, working with an experienced physiotherapist.

PEDUNCULATED ENDOMETRIAL CYST OF THE UTERUS

Report of a Case

Alexander A. Levi, M.D.*

BOSTON

IN THE case reported herein, a pedunculated endometrial cyst of the endometrium, 3.5 cm. in diameter, was removed at operation. Such a cyst is rarely seen by pathologists or surgeons, so that its discovery aroused considerable comment. This paper is therefore intended chiefly as a case report, but it also draws attention to the variety of pathologic changes which may involve the pelvic organs at the same time.

The patient was operated on twice, the procedure employed during the second operation being governed by the pathologic findings at the first.

Case Report

S. G., a 39-year-old woman, was first examined by me on September 16, 1939. She had been married for 21 years and had had three pregnancies, the oldest child being 19 and the youngest 13. There had been no miscarriages. The menses began at the age of 13 and occurred regularly every 28 days, lasting for 5 days. Two previous operations had been performed, a hemorrhoidectomy at the Boston City Hospital in 1936, and a dilatation and curettage, a Kelly advancement operation and anterior and posterior colporrhaphy at the Beth Israel Hospital on October 21, 1938. Following the latter operation an intravenous pyelogram was taken because of urinary complications. During this procedure a dermoid cyst of the left ovary was diagnosed.

The patient stated that since the last operation she had had pain in the left lower abdomen; her menses had been regular, and accompanied by severe pain just before and during each period. The last period had occurred on August 25. There was severe flow, and large clots were passed. Three weeks later the severe flow recurred. The bleeding continued actively, including the day on which examination was performed.

Examination showed the uterus to be in a normal position, about one third larger than normal, and tender. A hard mass, presumably a fibroid, half the size of a golf ball could be palpated in the right uterine wall above the cervicofundal junction. The right vault was normal. The left contained a movable tumor mass — the dermoid cyst — 10 cm. in diameter. The cervix was dilated, and a tumor mass 4 cm. in diameter projected partially through the external os. It was reddish blue and firm. Blood flowed profusely about it and out of the cervix.

The patient was operated on by me at the Evangeline Booth Hospital on September 17. At preoperative examination, under general anesthesia, the cervix admitted three or four fingers. On exploration with the finger a long pedicle was discovered coursing from the top of the intracervical tumor mass to its point of attachment, high in the uterine cavity on the right. The mass was dissected manually; the pedicle was cut at its base and the mass was removed intact. The uterine cavity was then curetted. A moderate amount of curettings was obtained.

Pathological examination of the tissues was performed at Tufts College Medical School by Dr. H. E. MacMahon. The report reads as follows:

> Specimen A consists grossly of a piece of tissue, circular, flat and measuring 2.5 by 2.0 by 0.3 cm. One surface is pigmented and granular, the other is rough and dissected microscopically. This is a strip of endometrial tissue with underlying myometrial smooth muscle. The endometrium shows a few glands surrounded by little or no stroma extending into the underlying muscle.
>
> Specimen B consists of a globular mass 3.5 cm. in diameter, fluctuant and opaque. One surface is bare and dissected and in this area the wall is thin. A larger area is covered by a layer of dense, opaque, bloodstained, skinlike tissue. Section of the mass

*Instructor, Department of Obstetrics, and teaching assistant, Department of Gynecology, Tufts College Medical School; senior visiting obstetrician, Evangeline Booth Maternity Hospital.

shows a smooth-walled cyst varying from 0.1 to 0.4 cm. in thickness and filled with chocolate-colored fluid. Microscopically, the cyst is lined by flattened, compressed and atrophic endometrium, composed of a single layer of flattened epithelial cells and a narrow zone of endometrial stroma. There is a layer of flattened atrophic muscle lateral to the stroma, and the outer surface is bordered by endometrium.

Diagnosis: pedunculated endometrial cyst of the uterus, showing no evidence of malignancy.

NOTE. I should consider these findings consistent with an endometrial cyst that has enlarged and filled the endometrial cavity like a polyp. The presence of the smooth muscle bordering the cyst indicates that it has originated in the myometrium rather than in the endometrium, as was suggested in the gross diagnosis.

The accompanying photographs (Figs. 1 and 2) demonstrate the size and structure of the cyst.

Although it was known at this time that an intramural fibroid tumor and dermoid cyst of the left ovary were

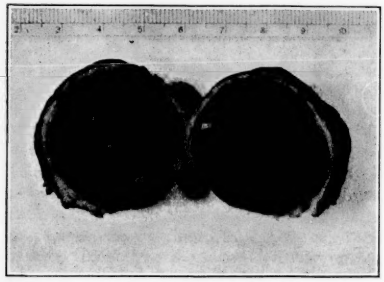

FIGURE 1. *Pedunculated Endometrial Cyst of the Uterus.*

present, abdominal surgery was not done. The patient's condition was unsatisfactory, as a result of the marked blood loss which she had suffered prior to this operation. Furthermore, it seemed unwise to subject her to an abdominal operation when it was known that she had had a dilated cervix for an indefinite period of time.

On January 4, 1940, I again operated on the patient at the Evangeline Booth Hospital. The operation, performed in two stages, consisted of dilatation, curettage and perineorrhaphy, and supravaginal hysterectomy and bilateral salpingo-oöphorectomy.

During the curettage it was noted that the endometrial tissue was extremely thick and more abundant than usual. Because of this finding and the previous pathological diagnosis, I felt justified in making a diagnosis of endometriosis of the uterine wall. With this background and the knowledge of the existence of a large dermoid cyst on the left side, I decided to remove the right ovary as well. The pathological report of the tissues removed at this operation and examined at Tufts College Medical School by Dr. James M. McFadden reads as follows:

The specimen consists of the body of a uterus measuring 6 by 7 by 4 cm. with the left tube and ovary attached. There is a 1.5-cm. laceration on the superior surface of the fundus, apparently rendered at time of removal. There is a firm leiomyoma about 2 cm. in diameter, with a firm, cut surface and swirled appearance, in the right aspect of the cervix. Also there are small grayish-brown spots measuring up to 2 mm. in diameter, located anteriorly to the uterine cavity and slightly to the right of the midline. These are consistent in gross appearance with endometriosis. The endometrium measures approximately 3 mm. in thickness. It is soft and gray with a bloodstained surface.

The fallopian tube is slender and measures 7.0 by 0.6 cm., and is stretched over the surface of a large ovarian cyst measuring 7.5 by 7.0 by 5.5 cm. Upon sectioning the ovarian cyst, the wall is seen to be thin, with a rough inner surface and a moderate growth of hair. The cavity is filled with a sticky, yellowish-gray, sebaceous-like material. There is a ridge on the inner surface measuring 1.5 by 1.0 cm. Sections of this ridge reveal a moderately firm, grayish-white, smooth, cut surface. Close by is a small hard area, and when it is opened two teeth of the incisor pattern are found, completely imbedded in the cyst wall. Also at one pole there is a corpus luteum 2 cm. in diameter.

The additional specimen consists of a free tube and ovary. The tube is small and has a normal gross appearance. The ovary measures 4 cm. in diameter, and section reveals numerous small follicular cysts and a corpus luteum. There are small hydatid cysts on the surface of the tube.

Microscopically, the sections of the dermoid cyst show the thin portion to be lined by stratified squamous epithelium. Sections through the ridge show this epithelium covering a mass of mucous glands. Also there is a small strip of cartilage present, some smooth

FIGURE 2. *Pedunculated Endometrial Cyst of the Uterus.*

muscle, and hollow structures lined by pseudostratified ciliated epithelium, similar in appearance to the respiratory type. The corpus luteum is noted. Sections of the uterine wall prove the small brown spots noted grossly to be endometrial islands. The leiomyoma is noted. The endometrium is in the early lutein phase. The fallopian tube is scarred. There is no evidence of malignancy.

Diagnosis: dermoid cyst of the ovary; corpus luteum and follicular cysts of the ovary; leiomyoma of the uterine cervix; endometriosis of the uterus (endometrium in early lutein phase).

The literature contains few reports of cases in which pedunculated endometrial cysts of the endometrium have developed to the size reported in this paper. To substantiate this, a statement by Novak[1] is offered. He says, ". . . that adenomyosis represents merely an increased growth activity of otherwise normal tissues, that it does not

assume the circumscribed form so characteristic of genuine neoplasms. . . ."

Changes representative of endometriosis less often involve the uterus. They are most frequently found in the pelvis or abdomen. Crile[2] writes:

> Endometriosis is defined as the presence of endometrial tissue in ectopic locations. . . . Endometrial tissue may be implanted on the ovary, on the pelvic peritoneum, in the umbilicus, in the rectovaginal septum or in the laparotomy scars. It functions as endometrium, undergoing the cyclic changes of menstruation. It is, therefore, capable of forming cysts of retained blood (chocolate cysts) and of producing pain at the time of menstruation. . . . It is interesting to note that more than 24 per cent of 37 patients in this series had fibroids of the uterus, endometriosis and menorrhagia. This association has been noted in other series of cases and cannot fail to suggest that there may be an underlying endocrine factor which could well be responsible for all three conditions.

This statement is quoted because it focuses attention on the variety of pelvic disease found in this case.

As to the rarity of such cysts, Masson[3] reports a study on the situations of adenomyomas found at operations performed from 1923 through 1934, inclusive. A total of 576 patients were operated on, but not one case disclosed the presence of a pedunculated endometrial cyst similar to that reported in this paper.

Summary

A case is reported of a thirty-nine-year-old woman in whom the following were found at the same time: a pedunculated endometrial cyst of the uterus, endometriosis of the uterine wall, an intramural fibroid and a dermoid cyst of the ovary.

In spite of the presence of multiple pathologic entities in the pelvis, almost no unusual changes occurred in the menstrual cycle.

Although endometriosis of the uterine wall is not rare, large endometrial cysts of the uterus are uncommon.

481 Beacon Street

References

1. Novak, E. *Gynecological and Obstetrical Pathology with Clinical and Endocrine Relations.* 496 pp. Philadelphia and London: W. B. Saunders Co., 1940. P. 180.
2. Crile, G., Jr. Endometriosis: a clinical study of thirty-seven cases. *Cleveland Clin. Quart.* 4:303-308, 1937.
3. Masson, J. C. Surgical significance of endometriosis. *Ann. Surg.* 102:819-833, 1935.

MEDICAL PROGRESS

ABDOMINAL SURGERY

ARTHUR W. ALLEN, M.D.*

BOSTON

DURING the past year many outstanding contributions have been made in the field of abdominal surgery. Some of the timeliest and most useful subjects are recorded.

ANESTHESIA

Bartlett[1] has described in detail a useful method of anesthesia for upper abdominal surgery. This consists in blocking the intercostal nerves from the seventh through the eleventh in the midaxillary line on both sides with 2 per cent novocain. He recommends that this be accomplished under light nitrous oxide and oxygen inhalation, which may be continued throughout the operation. Ten minutes is necessary to obtain the full effect of the novocain. This method has been used at the Massachusetts General Hospital in gastric as well as biliary-tract surgery with considerable satisfaction. Evipal or a similar preparation given intravenously can be substituted for nitrous oxide and oxygen. Splanchnic block by Ogilvie's[2] method added to intercostal block is helpful. Subcostal or transverse incisions are more easily closed when this type of anesthesia is used, although added relaxation of the abdominal wall can be obtained by novocain infiltration into the rectus sheaths.

WOUND HEALING

Whipple[3] selected the subject of the critical latent or lag period in the healing of wounds for his presidential address before the American Surgical Association at its annual meeting in 1940. He discusses the local and systemic conditions pertaining to wound healing. The local factors are the amount of killed or damaged tissue in wound surfaces, the vascularity of the tissues involved, the integrity of blood flow to the damaged tissue, the amount and character of the exudate in the wound space, the number and character of infectious organisms present and the number and character of foreign bodies to be extruded or encapsulated. The systemic factors are the age of the tissues (whether they are adolescent, normal adult, or senescent and degenerated), the state of hydration, nutritional balance, vitamin balance and the state of the general circulation and blood.

He describes the lag period as being that time between the receipt of the wound and the beginning of tensile strength between the approximated structures. Local factors are mainly the responsibility of the surgeon at the time of operation; they are sharp dissection, careful hemostasis, gentleness of touch, careful protection of the wound and the use of fine nonabsorbable suture material. The systemic factors are dealt with beforehand as much as possible, and this is continued during the convalescent period.

Coller and Valk[4] present a logical revival of the delayed closure of infected wounds. They recommend that the fat and skin be loosely packed open with acriflavin gauze, and that sutures be placed at the time of operation and tied on removal of the gauze twenty-four hours later. This is particularly adaptable to wounds made in the closure of colostomies, fecal fistulas and perforated appendices. The results are superior to those in wounds closed partially over drains of one sort or another. I have used their suggestion extensively with great satisfaction, and have found that iodoform gauze is fully as effective as acriflavin gauze. In some cases it is wise to use a small dose of Pentothal Sodium intravenously when tying the final sutures.

Cutler and Dunphy[5] present experimental and clinical evidence that fine silk in the closure of infected wounds is far superior to catgut. The amount of silk discharged from such a wound is no greater than in clean wounds. Hernia in the scar very rarely occurs when silk has been used, whereas it is a frequent sequel to infection when the wound had been closed with catgut. In frankly infected wounds, such as occur during operations for suppurative appendicitis, the layers of the abdominal wall are built up with interrupted fine silk sutures, but the skin itself is not closed. It occurred to Kelly[6] that the skin of such a wound might be safely closed at a later date, according to Coller's suggestion.

Meade and Ochsner[7] present excellent experimental and clinical evidence that cotton thread has all the advantages of silk in the repair of wounds, and in some respects other than its low cost is superior.

*Lecturer in surgery, Harvard Medical School; chief of the East Surgical Service, Massachusetts General Hospital.

Penetrating Wounds of the Abdomen

Two excellent presentations on penetrating wounds of the abdomen have come forth during the past year, those by Storck[8] and Rippy.[9] Both these authors analyzed the wounds according to severity, the viscera injured, the number of perforations, the age, sex and color of the patient and the time interval between injury and operation. The mortality is quite high, approximately 33 per cent. Early operation, performed as soon as shock can be combated, is recommended in all cases save shotgun wounds sustained at some distance from the weapon. Blood and plasma banks, better transportation facilities and the use of sulfanilamide, it is prophesied, will reduce mortality.

Hernia

Warvi and Orr[10] review the literature on hernia, discuss the embryology and anatomy and report a case of supravesical hernia. This is one of the infrequent causes of acute intestinal obstruction. The authors believe that hernia of the intestine in and about the urinary bladder is commoner than is usually thought, and suggest having this in mind when dealing with small-bowel obstruction.

Rienhoff[11] offers a modification of the Halsted "second" operation for inguinal hernia. He maintains that recurrence often takes place in the lower or critical angle of the wound, since structures in this area are prone to contain little or no fascia that can be easily approximated. This has been recognized by many surgeons, and various ways of correcting it have been offered. Rienhoff elevates the external oblique fascia to uncover as much of the lower rectus sheath as possible; then a longitudinal incision is made through the rectus fascia near the midline. He asserts that this allows the lower edge of the fascia, which is contiguous with the internal oblique, to be sutured to Poupart's ligament without tension. The cord is undisturbed and the cremaster utilized in the manner described in Halsted's second and finally adopted operation.

Appendicitis

Ravdin, Rhoads and Lockwood[12] report on a series of patients with appendiceal peritonitis treated by operation and sulfanilamide by hypodermoclysis. They have demonstrated experimentally that the drug reaches the blood level in the peritoneal fluid very quickly. They admit that their series is yet too small for accurate conclusions, but in comparison with a previous series of patients treated in the same clinic, one is impressed by the possibilities of the newer method. Delayed operation for better localization was used in approximately 2 per cent of cases. Wound drainage was used in 38 per cent of cases. Wangensteen–Paine suction was used routinely until there was active peristalsis and free passage of gas from the bowels. Sulfanilamide therapy was continued from five to seven days postoperatively. The mortality in the previous group of 552 patients was 1.4 per cent, whereas in 257 similar cases treated by the addition of sulfanilamide it was 0.4 per cent.

Barrow and Ochsner[13] have collected statistical data indicating that the mortality rate in appendicitis is not rising, as has been frequently stated, but is actually decreasing. They attribute this fact to a better understanding and management of appendiceal peritonitis.

Ulcers of the Stomach and Duodenum

Contributions continue with considerable profusion on the subject of ulcers of the stomach and duodenum. That ulcerative lesions of the stomach must be considered malignant until proved benign is a dictum that is gaining favor. Such patients are being more carefully followed and subjected to surgery, unless rapid and complete healing can be demonstrated radiologically or by the gastroscope. Physicians are no longer misguided by the frequent improvement of symptoms and the early decrease in the size of the crater when palliative measures are tried. Increasing numbers of patients are benefited by early resection, while the carcinoma is still in situ and therefore curable. Patients developing first symptoms after middle life who have a gastric ulceration are so likely to have a malignant lesion that little time should be wasted on palliative treatment.

Subtotal gastrectomy for duodenal ulcer is giving a high percentage of patients who continue to be symptom free. The operative mortality for such procedures is now very low in the hands of men experienced in this field. Walters[14] and McClure and Fallis[15] reported their experiences during the past year.

The amount of stomach removed in square centimeters has also interested Wangensteen et al.[16] Their analysis concerning the permanent lowering of the gastric acidity following various surgical procedures is interesting but not too convincing, especially in regard to the Finsterer exclusion procedure. Many surgeons have been faced with stomal ulcers following this operation, and believe that the antrum should never be left in situ unless the mucosa has been removed. I am not too pleased with it even so, since, although the acid-activating hormone may be removed by eliminating the mucosa, a poor structure to close is left. Two nonfatal leakages have occurred in my own series

of such operations, and for this reason I believe that extirpation of the antral segment with as much of the fundus as possible should be done whenever possible.

Zollinger[17] suggests a plan for radical fundisectomy, particularly when dealing with secondary ulcerations. His operation is well conceived, and on occasion may be of value. Simpler methods, however, seem adequate, provided an effort is really made to include a large segment of the fundus in routine subtotal gastrectomy.

More awareness of the hazard of massive hemorrhage from gastric and duodenal ulcer is apparent. Hinton and Maier[18] believe that the chronicity of the ulcer is a better explanation of fatal bleeding than is the age of the patient. At the Massachusetts General Hospital, we[19] analyzed our own cases on the basis of all factors, including duration of symptoms, and were disappointed that our preconceived idea of chronicity was not evident in the fatal group. The dividing line of approximately fifty years of age between those who spontaneously recovered and those who died was an unexpected finding. It has held true in our clinic, and we have been able to rescue 8 patients with duodenal and 3 with gastric ulcerations above the age of forty-eight from acute massive hemorrhage by early radical operation; during this time none below this age have bled to death on conservative treatment. The fact that Hinton and Maier[18] have been able to obtain a better history and thus interpret their findings on the basis of a long-standing callous ulcer is of additional importance, and suggests another way of selecting the proper patient for operation. Wangensteen[20] believes that the age or chronicity factors are not so vital as the stage of shock produced by the hemorrhage. If profound shock occurs, it should be combated and radical operation undertaken. I doubt the soundness of this policy, since we have seen many patients in the most profound shock, even with repeated episodes over a period of several days, recover. Those with elastic blood vessels will make a recovery so that operation can be undertaken at an optimum time of election. One may argue that the mortality in modern gastrectomy is so low that one need not worry about those who may die or recover from hemorrhage, and may advocate early operation on them all, as does Finsterer.[21] Economically, this is sound. In practice, however, when large groups of statistics are available the added risk during acute hemorrhage in the young patient is unjustifiable. Graham, Horsley, Hinton and Clute in an unpublished panel discussion on "Acute Massive Hemorrhage from Peptic Ulcer" agreed on many important points. First, conservative management of most patients during the acute phase is the correct method of treatment. Second, operation, if undertaken, should be a radical procedure with ligation of the vessels supplying the ulcer area; this should be done early before depletion of the tissues has taken place or not at all. Third, the occasion for such a procedure is rare, but if well conceived at the right time and on the right patient, a rescue may be made. Fourth, early feeding is reasonable, but the patient must desire the food and not be forced to take it. Fifth, feedings may be of any type so long as the food is finely divided and smooth.

Rare Tumors of the Abdomen

Lahey and Colcock[22] have reported on 7 cases of leiomyoma and leiomyosarcoma of the stomach treated in the Lahey Clinic. Five of their cases showed sarcomatous degeneration, and for this reason they advocate radical resection rather than local removal of the tumor. One of their cases required total gastrectomy. The tendency for such lesions to bleed profusely is well known, the first symptom being that of massive hemorrhage. Often the lesions are mistaken for inoperable carcinoma. Many of these tumors are quite benign, but the determination of this point cannot be made until the sections have been studied.

Ransom and Kay[23] call attention to the frequency of tumors of neurogenic origin commonly supposed to be leiomyomas, and report 9 cases with such tumors of the stomach encountered in a total group of 18 cases with neurogenic tumors of the abdomen. Radical surgery, they hold, is indicated when possible in this type of tumor, since many of them are sarcomatous. The results have justified this radical attitude. Morton[24] calls attention to a very large tumor of this nature that was reduced to an operable state by previous x-radiation. Miller[25] has had a similar experience with postoperative radiation in a large neurogenic sarcoma involving the bladder.

Carcinoma of the Stomach

There is a gradual awakening among the profession to the terrific toll of human life taken by carcinoma of the stomach. Probably not less than 30,000 deaths occur every year in the United States from this cause. It is gratifying to learn that Surgeon General Parran plans an educational campaign on this subject in the near future. So far, the etiology is unknown. Some cases appear to develop from a benign ulcer, but proof of this is hard to establish. Early diagnosis followed by immediate operation is the only way to improve the very discouraging cure rate. At present, on all

figures available for follow-up studies, the percentage of five-year cures in cancer of the stomach is approximately 5. It is discouraging to the surgeon to be able to rescue so few patients admitted to the hospital with this diagnosis. Palliative resections are justifiable whenever possible, since many of these patients have a respite of two or three years.

The most valuable measures to improve the situation are as follows. Every ulcerating lesion of the stomach must be considered malignant until proved benign; this means constant supervision until the ulcer is completely healed and remains healed by follow-up examinations. Symptoms of stomach disorders beginning after the age of forty must be considered to be due to cancer of the stomach until proved otherwise; symptoms and physical examination must be carefully evaluated; gastric analysis, x-ray studies and gastroscopy must all be employed in an effort to find the lesion. Ulceration of the stomach manifesting itself for the first time and without previous symptoms after the age of forty is so likely to prove malignant that palliative treatment should be of very short duration or entirely abandoned in favor of early radical surgery. The laity must become conscious of this danger and must be warned against delay in reporting their symptoms to their physicians. Legislation should be sought to limit the advertising of remedies for indigestion, particularly over the radio.

Contributions to the technic of gastrectomy for carcinoma are as follows. Wangensteen[26] demonstrates a feasible aseptic gastric resection for subtotal gastrectomy. This is particularly applicable to the achlorhydric stomach involved with a localized infected carcinoma. Smithwick[27] has developed an aseptic technic applicable to total as well as subtotal gastrectomy and colectomy. This is based on the production of a firm char of healthy tissue over a broad clamp with a slow cautery. A basting stitch is placed through the eschar, and the anastomosis made without danger of leakage. It is possible that the use of some such chemical as sulfanilguanidine[28] may eliminate most of the danger of infection during operations on the gastrointestinal tract. This drug is said to be absorbed poorly by the host and to rid the tract of infectious organisms in a short time when administered by mouth.

Graham[29] has published his results with total gastrectomy for advanced carcinoma. Owing to difficulty with leakage at the esophagojejunal anastomosis by the usual methods, he suggests a modification that encloses the lower end of the esophagus in the loop of jejunum. This is done in such a manner as to bring a very broad surface of the serosa of the jejunum in contact with the external layers of the esophagus. The jejunal loop is also carefully suspended from the diaphragm. Total gastrectomies for extensive cancer have been performed in more than 50 cases by the staff of the Massachusetts General Hospital. The procedure is now well standardized, and the immediate results are excellent.

Duodenal Diverticula

Morton[30] has collected the surgical literature on duodenal diverticula and summarizes the operations in 49 cases reported since 1915. He adds 2 cases operated on in the University of Rochester Clinic, commenting on the fact that the diagnosis of primary diverticulosis of the duodenum had been made in that clinic in at least 33 cases. This emphasizes the frequency of the lesion itself, but the rareness for the need of a surgical attack on it. He points out that surgery is indicated for the following reasons: mechanical—giving rise to symptoms from local stasis in the diverticulum or from partial obstruction to the biliary tract, pancreatic ducts or duodenum; inflammatory—local diverticulitis, perforation, abscess and peritonitis or secondary inflammation of the biliary tract (jaundice), pancreas, duodenum and retroperitoneal tissues; and neoplastic changes. The results in all reported cases were at least 80 per cent successful. In 8 cases no follow-up was given. In 6 per cent the symptoms were not relieved. The mortality rate was 6 per cent.

Ulcerative Colitis

Cave[31] in a review of his experience with ulcerative colitis describes in detail his present method of performing permanent ileostomy. This leaves the proximal end of the ileum in the right lower quadrant, brought out through a modified McBurney incision. The distal segment, which becomes a mucous fistula, is brought out through a stab wound to the left of the midline just below the umbilicus. Cave says that this reduces the complications of ileostomy and simplifies the procedure of colectomy at a later date. This method may be valuable, since chemotherapy (with sulfanilguanidine[28]) can be applied directly to the diseased bowel. This at least offers possibilities for further study, both in regard to relief of symptoms and in regard to the preparation of the colon for removal.

Stone[32] reports a method of performing a collecting reservoir of terminal ileum just proximal to the ileostomy for the purpose of decreasing the constant discharge of liquid contents. He used this procedure in 3 cases and was pleased with the results, since much of the fluid content was

absorbed from the pouch, thus producing a thicker and more easily managed ileostomy discharge.

McKittrick[33] has found that the preoperative use of the Miller-Abbott tube greatly facilitates colectomy in these cases. The small intestine becomes fluted on the tube, and so perfectly collapsed that it is easily kept out of the way during the removal of the colon.

Irradiation Burns of the Intestine

White[34] reports 7 cases in which serious secondary involvement of the colon and ileum followed heavy radiation in the treatment of carcinoma of the cervix. This reaction has often been noted in mild degree, but in some cases such severe contraction of the intestine takes place that obstruction occurs. Fibrosis and ulceration are associated with bleeding and perforation. Temporary colostomy may be all that is needed in some cases of moderate severity, but permanent colostomy or resection is needed to relieve the more advanced lesions. White points out that the situation is probably far commoner than is recognized, and believes that often the symptoms are explained on the basis of a hopeless recurrence of the original disease, whereas as a matter of fact many such patients may be rescued by a proper surgical attack. Jones[35] and Todd[36] also call attention to rectal and intestinal complications following radiation for pelvic malignancy. Meigs[37] has had a similar experience.

Carcinoma of the Colon and Rectum

Whipple[38] reports some striking results in surgery of the large bowel with the preoperative and postoperative use of the Miller-Abbott tube. In 76 cases of colon and rectal resections for carcinoma in various regions and by selective methods without the use of the Miller–Abbott tube there were 14 deaths, a mortality of 18 per cent. In 36 similar cases treated surgically in the same manner but with the use of the Miller-Abbott tube there was 1 death, a mortality of 3 per cent. Whipple thinks that the tube may replace any need for the two-stage operations in right colectomy but that, although it is valuable in the management of lesions of the left colon and rectum, it does not eliminate the need of cecostomy.

Whipple points out the importance of having two members of the resident staff, a roentgenologist and a graduate nurse assigned to special duty for the introduction and management of the Miller-Abbott tube in large clinics. This is certainly advantageous in the formative period. As experience in this field accumulates, the difficulties and limitations of its use are becoming rapidly established. Ogilvie[39] has made an excellent report from Guy's Hospital on this subject. In my opinion, it ranks second only to chemotherapy as the outstanding contribution to surgery during the past five years.

Coller, Kay and MacIntyre[40] have studied a group of specimens of rectal carcinoma clarified by the method used by Gilchrist and David.[41] They found lymph-node involvement in 64 per cent of the cases studied, invasion of the blood vessels in 15 per cent. The age of the patient, the duration of symptoms, the size of the tumor and the size of the lymph nodes were unrelated to operability or to the lymph-node involvement and therefore to the prognosis. Anterior-wall lesions were more apt to reveal metastases. Only lesions within 3 cm. of the mucocutaneous junction showed lateral metastases. Above this region the spread of the disease was invariably upward or proximal to the lesion. Infiltrations through the wall of the bowel were accompanied by 91 per cent nodal involvement, whereas those confined to the wall showed 43 per cent metastatic nodes. Metastases were found in 81 per cent of sessile, 54 per cent of polypoid, and 33 per cent of excavating neoplasms. So far as could be determined, 28 per cent of all rectal carcinomas developed in polyps, and in another 42 per cent of the specimens benign polyps were also present.

Liver

Ravdin[42] presents experimental and clinical evidence that the liver may be protected from the damage inflicted on it by anesthesia and the other effects of any surgical procedure. He points out that carbohydrate is in itself insufficient, since its action is transient and the capacity of the liver cells for this substance is limited. Protein, on the other hand, is stored to better advantage and is utilized for liver-cell protection in a satisfactory manner. He suggests that the preoperative diet should contain approximately 70 per cent carbohydrate, 25 per cent protein and 5 per cent fat to obtain the maximum protection against liver damage.

Corriden[43] reports a successful operative procedure for extensive intracapsular hemorrhage of the liver. Confronted with a large bleeding cavity, he quickly detached the rectus muscle and filled the crater with it, holding it in place by loose sutures. The convalescence was stormy, but recovery took place.

Wallace[44] reports the successful removal of a large hepatoma involving a portion of the right lobe of the liver. The patient was symptom free after five years. He reviews the literature on the subject and brings it up to date.

Pancreas

Morton and Widger[45] present an excellent paper

on the diagnosis and treatment of acute pancreatitis. They believe that there are three grades of this disease: the acute edematous, the hemorrhagic and the suppurative. Serum amylase determinations were more helpful than any symptoms, signs or other laboratory tests in establishing the diagnosis. Conservative treatment is advocated in all cases; in those which do not improve, operation may be beneficial. The operation should consist in biliary-tract drainage, the drainage of the abscess or necrotic area if it exists, but never incision of the pancreas itself. Unless an accurate diagnosis can be made, exploration is necessary to rule out a surgical emergency, such as perforation of peptic ulcer. In addition to the above, with which I agree, I should like to point out that persistent nausea in these cases may prevent adequate nourishment over too long a period. I have resorted to jejunostomy for feeding in these cases, with considerable satisfaction. Morton and Widger suggest that the pancreas is so like the parotid gland in structure that inflammation may respond to x-ray treatment in the former as it does in the latter. They have tried this form of therapy, giving only 250 to 450 r in broken doses of 50 to 100 r. Their early impression of this type of treatment is favorable.

David[46] reviews the literature and reports a case of his own of partial pancreatectomy for hypoglycemia. He concludes that in a patient with the Whipple[47] triad of symptoms (attacks of nervous or gastrointestinal disturbances coming on in a fasting state, associated with a hypoglycemia with readings below 50 mg. per 100 cc. and relieved immediately by ingestion of glucose), removal of the tail and body of the pancreas to the level of the superior mesenteric vessels is justifiable if careful search has failed to reveal an islet tumor. There was 1 death in 17 reported cases, and the results were satisfactory in 11. He questions the diagnosis in 2 of the remaining 4. The explanation of these good results is not clear, since hyperplasia of the islet cells was found in only 2 of the specimens. Normal pancreatic tissue was reported in 14 cases.

References

1. Bartlett, R. W. Bilateral intercostal nerve block for upper abdominal surgery. *Surg., Gynec. & Obst.* **71**:194-197, 1940.
2. Ogilvie, W. H. Cancer of the stomach. *Surg., Gynec. & Obst.* **68**:295-305, 1939.
3. Whipple, A. O. Address of the president: the critical latent or lag period in the healing of wounds. *Ann. Surg.* **112**:481-488, 1940.
4. Coller, F. A. and Valk, W. L. The delayed closure of contaminated wounds: preliminary report. *Ann. Surg.* **112**:256-270, 1940.
5. Cutler, E. C. and Dunphy, J. E. The use of silk in infected wounds. *New Eng. J. Med.* **224**:101-107, 1941.
6. Kelly, C. E. discussion of Cutler and Dunphy.[5]
7. Meade, W. H. and Ochsner, A. The relative value of catgut, silk, linen, and cotton as suture materials. *Surgery* **7**:485-514, 1940.
8. Storck, A. H. Penetrating wounds of the abdomen: analysis of forty-six personal cases. *Surgery* **111**:775-819, 1940.
9. Rippy, E. L. Perforating gunshot wounds of the abdomen. *J. A. M. A.* **115**:1760-1765, 1940.
10. Warvi, W. N. and Orr, T. G. Internal supravesical hernias. *Surgery* **8**:312-325, 1940.
11. Rienhoff, W. F., Jr. The use of the rectus fascia for closure of the lower or critical angle of the wound in the repair of inguinal hernia. *Surgery* **8**:326-339, 1940.
12. Ravdin, I. S., Rhoads, J. E. and Lockwood, J. S. The use of sulfanilamide in the treatment of peritonitis associated with appendicitis. *Ann. Surg.* **111**:53-63, 1940.
13. Barrow, W. and Ochsner, A. Treatment of appendical peritonitis. *J. A. M. A.* **115**:1246-1250, 1940.
14. Walters, W. Cardinal gastric ulcers: results of operation for apparently inaccessible lesions. *Arch. Surg.* **41**:542-553, 1940.
15. McClure, R. D. and Fallis, L. S. Partial gastrectomy for peptic ulcer. *Surgery* **8**:575-586, 1940.
16. Wangensteen, O. H., Varco, R. L., Hay, L., Walpole, S. and Trach, B. Gastric acidity before and after operative procedure with special reference to the role of the pylorus and antrum. *Ann. Surg.* **112**:626-670, 1940.
17. Zollinger, R. Gastric resection with removal of the fundus in the treatment of duodenal ulcer. *Surgery* **8**:79-93, 1940.
18. Hinton, J. W. and Maier, R. L. Chronic duodenal ulcer: procedures as determined by operative pathology. *Ann. Surg.* **111**:348-354, 1940.
19. Allen, A. W. and Benedict, E. B. Acute massive hemorrhage from duodenal ulcer. *Ann. Surg.* **98**:736-749, 1933.
    Allen, A. W. Acute massive hemorrhage from the upper gastrointestinal tract. *Surgery* **2**:713-731, 1937.
20. Wangensteen, O. H. The problem of surgical arrest of massive hemorrhage in duodenal ulcer: technique of closing duodenum. *Surgery* **8**:275-288, 1940.
21. Finsterer, H. Surgical treatment of acute profuse gastric hemorrhages. *Surg., Gynec. & Obst.* **69**:291-298, 1939.
22. Lahey, F. H. and Colcock, B. P. Diagnosis and surgical management of leiomyomata and leiomyosarcomata of the stomach. *Ann. Surg.* **112**:671-686, 1940.
23. Ransom, H. K. and Kay, E. B. Abdominal neoplasms of neurogenic origin. *Ann. Surg.* **112**:700-746, 1940.
24. Morton, J. J. discussion of Ransom and Kay.[23]
25. Miller, R. H. personal communication.
26. Wangensteen, O. H. Aseptic gastric resection. *Surg., Gynec. & Obst.* **70**:59-70, 1940.
27. Smithwick, R. unpublished data.
28. Trimble, I. R. personal communication.
29. Graham, R. The technique for total gastrectomy. *Surgery* **8**:257-264, 1940.
30. Morton, J. J. Surgical treatment of primary duodenal diverticula. *Surgery* **8**:265-274, 1940.
31. Cave, H. W. and Nickel, W. F. Ileostomy. *Ann. Surg.* **112**:747-762, 1940.
32. Stone, H. B. discussion of Cave and Nickel.[31]
33. McKittrick, L. S. personal communication.
34. White, W. C. Irradiation burn of the intestine. *Ann. Surg.* **112**:769-774, 1940.
35. Jones, T. E. Intestinal complications resulting from prolonged radium and x-ray irradiation for malignant conditions of pelvic organs. *Am. J. Obst. & Gynec.* **29**:309-316, 1935.
36. Todd, T. F. Rectal ulceration following irradiation treatment of carcinoma of the cervix uteri. *Surg., Gynec. & Obst.* **67**:617-631, 1938.
37. Meigs, J. V. personal communication.
38. Whipple, A. O. The use of the Miller–Abbott tube in the surgery of the large bowel. *Surgery* **8**:289-293, 1940.
39. Ogilvie, W. H. The late complications of abdominal war-wounds. *Lancet* **2**:253-256, 1940.
40. Coller, F. A., Kay, E. B. and MacIntyre, R. S. Regional lymphatic metastasis of carcinoma of the rectum. *Surgery* **8**:294-311. 1940.
41. Gilchrist, R. K. and David, V. C. Lymphatic spread of carcinoma of the rectum. *Ann. Surg.* **108**:621-642, 1938.
42. Ravdin, I. S. The protection of the liver from injury. *Surgery* **8**:204-211, 1940.
43. Corriden, T. F. Subcapsular rupture of the liver in a child. *Surgery* **8**:446-455, 1940.
44. Wallace, R. H. Resection of the liver for hepatoma. *Arch. Surg.* (in press).
45. Morton, J. J. and Widger, S. The diagnosis and treatment of acute pancreatitis. *Ann. Surg.* **111**:851-863, 1940.
46. David, V. C. The indications and results of pancreatectomy for hypoglycemia. *Surgery* **8**:212-224, 1940.
47. Whipple, A. O. and Frantz, V. K. Adenoma of islet cells with hyperinsulinism. *Ann. Surg.* **101**:1299-1335, 1935.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

CASE 27041

PRESENTATION OF CASE

A sixty-five-year-old artist entered the hospital complaining of abdominal pain.

Because of the patient's condition the history was obtained from his wife and his physician. Three years before admission the patient had an attack of upper abdominal pain situated near the midline. This pain was constant, nonradiating, lasted four days and was unaccompanied by fever, chills, vomiting, jaundice or back or shoulder pain. The patient remained well until three days before admission, when he was seized at 3 p.m. with a moderately severe pain in the right upper quadrant of the abdomen, accompanied by vomiting and anorexia. His physician found tenderness with slight spasm in the right upper quadrant just beneath the costal margin. The pulse was regular, the blood pressure 150 systolic, 90 diastolic; the pain was considerably alleviated by morphine. The patient had a fairly comfortable night with the aid of sedatives. In the morning the pain was less severe, but there was marked nausea in addition to the vomiting, and he complained of a burning or sour sensation in the stomach. The temperature was 99.5°F.; the pulse was still regular. One day before admission there was slight residual pain, but his physician noted that the heart rhythm was completely irregular. The patient was unable to sleep that night because of pain and discomfort, and early in the morning recalled his doctor. The patient had vomited once during the night; the vomitus was watery and contained no blood. Examination revealed absence of abdominal tenderness, but a marked pulse deficit, in addition to auricular fibrillation. The patient had had a bowel movement the morning of the day the attack of pain began, but none thereafter, although he was given an enema on the day before admission. Following the onset of the attack, he had had no appetite and had eaten practically nothing.

One brother had died of tuberculosis, and the family, as a whole, was said to be subject to "mild rheumatism." The patient had had no serious previous illnesses.

On examination the patient was pale, extremely obese, drowsy, but in no apparent distress. The pupils were small, but equal, and reacted only slightly to light. There was no jaundice. The heart was not enlarged to percussion, but was fibrillating rapidly, with a marked pulse deficit. No evidence of valvular disease, gallop rhythm or accentuation of the pulmonic second sound was detected. Examination of the lungs was negative. The abdomen was somewhat tense throughout, with no areas of definite tenderness; peristalsis was present. There was no peripheral edema.

The temperature was normal, the pulse 135, and the respirations 22.

Examination of the urine showed a ++ test for albumin. Examination of the blood showed a red-cell count of 4,600,000 with a hemoglobin of 16.1 gm. (photoelectric-cell technic), and a white-cell count of 36,500 with 91 per cent polymorphonuclears. The nonprotein nitrogen of the blood serum was 28 mg. per 100 cc.; a blood Hinton test was negative.

X-ray films of the abdomen showed multiple stones, each about 1 cm. in diameter, within the gall bladder. An electrocardiographic recording showed auricular fibrillation, with a rate of 140 to 150; the T waves were upright and of good amplitude; there was no abnormal axis deviation.

The patient was digitalized rapidly, and by the following day the ventricular rate had fallen to 115. Two days later the paroxysm of fibrillation had subsided, with the restoration of a regular rhythm at 88 per minute. The white-cell count during this time swung between 14,000 and 22,000.

On the seventh hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. HORATIO ROGERS: Are the x-rays pertinent?

DR. AUBREY O. HAMPTON: These are apparently plain films of the gall-bladder area. As the record stated, the patient was very obese, and the films are therefore not so good as usual. The stones are obvious. The right side of the diaphragm is normal.

DR. ROGERS: You cannot say anything about abnormal amounts of air in the intestines?

DR. HAMPTON: The whole abdomen is not shown. One can see the region of the terminal ileum and ascending colon, which seems to be normal. There is a little gas in the terminal ileum, without dilatation.

DR. ROGERS: The patient was sixty-five and extremely obese, and in his past history he had had

one three-day episode of abdominal pain, which was not characteristic of gall-bladder disease or of duodenal ulcer, although it is said to have been in the upper abdomen. He was then well for three years and had an acute episode, which is very sparsely described. It started abruptly, — we may infer by the exactness of the hour, — with moderately severe pain accompanied by vomiting and anorexia, and the physician at that time noted nothing unusual about the pulse.

We then come to the admission to the hospital three days after the onset, when the patient was so sick that the history had to be taken from his wife and physician. He was drowsy but in no apparent distress. His pupils were small, but equal, and reacted only slightly to light. I suspect that morphine may have been part of the cause of his drowsiness. Later on, a nonprotein nitrogen determination showed that he was not in uremia. He presumably was not in diabetic coma, since there was no sugar in the urine; he must consequently have been very sick from his abdominal condition. But in spite of that the temperature was normal, although the white-cell count was 36,500 with 91 per cent polymorphonuclears. The abdomen was somewhat tense, but there were no areas of tenderness, and peristalsis was present. The patient did not have general peritonitis. His bowels had not moved, but he had eaten practically nothing since the onset. He had irregular fibrillation, and with digitalization, that subsided and a normal pulse returned. We are thus deprived of knowing what his pulse variations were during his preoperative hospital stay. An operation was then performed, apparently when he was somewhat better than he had been on admission.

There are a number of very interesting things about this case. To start with the most generalized considerations, the patient was relatively old, and he may have had cancer. If so, where would it be? Everything points to the right upper quadrant, and the only things that I can think of are the duodenum, the liver, the gall bladder, the bile ducts and the right colon. There is certainly nothing in the past history to suggest cancer. The episode three years previously does not fit in with cancer, in view of his subsequent good health. The abruptness of this recent episode, which brought the patient to the hospital, does not fit well with cancer unless we assume that a gradual occlusion had suddenly become complete. On the whole I do not believe that there is enough evidence to consider cancer very seriously.

The intestine might have been the cause of the trouble. The patient might have had a Richter's hernia, either external or internal; but he was much too sick, and of course the story is not suggestive and there is not enough to consider that seriously. He might have had an appendiceal abscess, with a very high cecum. In people of sixty-five, particularly very obese people, the story and physical examination can be most obscure. He might have perforated his appendix at 3 p.m. without any prodromal symptoms that he could describe. Empyema of the gall bladder is also a possibility. We know that he had stones in his gall bladder, that he had some episode of upper abdominal pain three years before entry, and that this episode came on abruptly, as lodgment of a stone in the cystic duct might. The high white-cell count could be interpreted as evidence of undrained pus. The surgeons might not have felt the distended gall bladder because the patient was extremely obese. He had no jaundice, but he would not have had it if only the cystic duct had been obstructed, and that is all we can say for that.

The most striking disparity in this record is that between the white-cell count of 36,000 and the normal temperature. The likeliest explanation is a vascular accident. I can think of other things that could account for the high white-cell count and normal temperature — perhaps chemical peritonitis, perhaps certain neoplasms, perhaps a very sick or moribund patient who already had a leukocytosis but whose temperature had begun to go down with approaching death. On the whole some vascular accident seems likeliest in this man, who had a grossly abnormal vascular system. It is interesting that his abdominal symptoms began while his pulse was still regular. If he had had auricular fibrillation first, and then developed pain with this sequence of events, mesenteric thrombosis would be likelier, but that may be a minor point. Nothing is said about blood in the stools, because the patient did not have stools; he had no persistent tenderness, which I should expect if he had had mesenteric thrombosis. He did not have peritonitis enough to interfere with peristalsis. We have no x-ray evidence bearing on that. The distribution of the pain does not tell very much. It is simply under the costal margin. Nothing is said about radiation to the back. Nothing is said about the serum amylase; I assume it was not elevated, as it would be in pancreatitis.

It may not be quite fair, but one might ask what sort of operation was contemplated in a man in this condition, surely not any very radical or extensive surgery. Operation was performed with the idea of doing some small thing that was necessary, such as draining an empyema of the gall

bladder or relieving obstruction, rather than a resection for mesenteric thrombosis. If the patient did not need resection, the mesenteric thrombosis was best left alone.

Without more data I am merely guessing, but I hope I have at least mentioned what the condition really was. Either mesenteric thrombosis or empyema of the gall bladder seems probable, and I shall guess the latter.

DR. GRANTLEY W. TAYLOR: I think it would be interesting to have something on record indicating why operation was performed. We have his essentially negative physical examination, and in the laboratory work-up all we have is an elevated white-cell count.

DR. TRACY B. MALLORY: Can you give any additional information, Dr. Welch?

DR. CLAUDE E. WELCH: I am the person alluded to as "the physician" in this case. I saw the man from the beginning through to the end, and although Dr. Rogers does not have all the details as we had them, we followed exactly his train of thought. In the first place here was a heavy man, weighing 250 pounds before he was taken ill. Two other things about his course at home and in the hospital seemed of importance. One, which Dr. Rogers has pointed out, was the extreme disparity between the white-cell count and the normal temperature, which persisted throughout. The second was the remarkable amount of pain, which the patient could not localize but nevertheless complained about bitterly, requiring large amounts of morphine. Physical examination throughout the stay in the hospital, as may be inferred from the notes, remained just about normal, with the exception of the finding, when he first came in, of definite tenderness and spasm in the right upper quadrant. During the first few days we considered that he probably had an acute gall-bladder disease and that if we operated on him he would probably die; the latter turned out to be correct. We therefore treated him conservatively, despite the high white-cell count, for nine days. As a matter of fact he was out of bed two days, and was apparently getting better. During that time an icteric index was taken, which was normal; Dr. Cope's laboratory reported a normal serum amylase. On the morning of the seventh day the patient suddenly had another severe attack of pain in the right upper quadrant and complained of increased pain, and again had spasm. Accordingly we believed that we were dealing with what had been acute gall-bladder disease, which instead of subsiding had perforated. We decided that an emergency operation was indicated.

I think a little more discussion at this point might be pertinent.

DR. ROGERS: I should like to hear what his bowels did during the seven days.

DR. WELCH: He had had two or three small movements that were not abnormal. We were getting him out of bed, assuming he was well enough to go home, when the second episode happened.

DR. LELAND S. MCKITTRICK: Did he like food, or was it hard for him to eat?

DR. WELCH: He ate very little, and had no appetite.

DR. MCKITTRICK: I do not know what was the matter with him, but here and there in the story a number of things suggest pancreatitis, and I wonder how seriously it was considered. There are a number of things that are not quite right, it is true, but he had nausea and vomiting out of proportion to other things when the attack of pain came on. He had severe pain, but even when the pain was better he was uncomfortable and had nausea and vomiting. In other words, as I gather, he was quite uncomfortable in the hospital, at times without anything very definite to account for it. Dr. D. F. Jones used to lay a great deal of emphasis on indefinite, mild pain, persistent nausea and inability to eat, usually associated with deep tenderness along the course of the pancreas.

A PHYSICIAN: In the absence of pain in the back, how seriously would you consider pancreatitis?

DR. MCKITTRICK: Pain in the back may be important, but it is too often absent. To me it is of little or no help, and the diagnosis is frequently made without this symptom. The high white-cell count without fever also suggests to me the possibility of pancreatitis.

DR. WELCH: We considered pancreatitis, but not seriously.

On opening the abdomen in the right upper quadrant no free fluid was found. The gall bladder was soft, contained stones, but was not acutely inflamed. When we lifted the transverse colon the pancreas could be felt; it was hard and enlarged one and a half times its normal size, with small areas of fat necrosis at the base of the transverse mesocolon. Accordingly, the gall bladder was emptied of stones, a drain put in, and the abdomen closed.

DR. MALLORY: Dr. Welch tells me that after operation the patient went along in much the same state for a few days, then had another extremely severe attack of pain and died very suddenly.

CLINICAL DIAGNOSES

Acute cholecystitis.

Rupture of the gall bladder?

Dr. Rogers's Diagnosis

Empyema of the gall bladder?
Mesenteric thrombosis?

Anatomical Diagnoses

Acute pancreatitis.
Chemical peritonitis.
Cholelithiasis.
Chronic cholecystitis.
Biliary cirrhosis of the liver, slight.
Rheumatic heart disease, with slight aortic and mitral stenosis.
Hypertrophy.
Obesity.

Pathological Discussion

Dr. Mallory: At autopsy the chief finding was in the pancreas. At the time of operation it had been enlarged and hard; at the time of autopsy it was deliquescent. There was a mass of fluid, necrotic exudate, walled by chalky fat necrosis and a few recognizable remnants of pancreas. There was a slight diffuse chemical peritonitis. The heart was considerably hypertrophied, and showed mild chronic, rheumatic, mitral and aortic involvement. Microscopically the liver showed a trace of biliary cirrhosis.

Dr. Rogers: I am very glad Dr. McKittrick was here because otherwise the diagnosis would barely have been mentioned, certainly not discussed.

A Physician: Should the serum amylase have given some help?

Dr. Welch: In this patient it was determined at a late stage of the disease, when it is often found to be normal.

CASE 27042

Presentation of Case

A forty-nine-year-old Canadian housewife entered the hospital complaining of abdominal pain.

The patient had been perfectly well until eight months prior to entry, when, while doing some housework, she suddenly fainted and remained unconscious for about twenty minutes. After regaining consciousness she had a shaking chill for twenty minutes, followed by a sensation of warmth and diaphoresis. There were no other associated symptoms, and she remained well until two months later, when she had another severe chill, lasting for several hours, after which she had a drenching sweat. At this time she developed pain in the region of the umbilicus. The pain was rather sharp in character and rapidly increased in severity until it doubled her up; it gradually subsided in three or four minutes. These attacks recurred at irregular intervals, with varying severity, for about a week. During this period the patient fainted five times. While suffering from pain she noticed a lumpy protrusion of her abdomen, which moved up and down and disappeared when the pain ceased. Her appetite was unimpaired, and there was no relation of the attacks to the ingestion of food. About four days after the onset of this episode, she had a sore throat for several days. She remained well thereafter until seven weeks before admission, and then began to have attacks of pain similar to those previously experienced. They still occurred in three-minute or four-minute cycles, but radiated from the umbilicus to the pubis and directly backward to the spine. The severity was generally increased, and the patient noted that "heavy" foods, particularly vegetables, appeared to aggravate the condition. There was never any nausea, emesis or melena, and her habitual constipation remained unchanged. She lost about 5 pounds during the eight months.

She had had mumps at twenty-two years of age, kidney trouble with the passage of "brick-dust" colored urine for five weeks at thirty-three, and diphtheria at thirty-five.

Physical examination showed a well-developed and well-nourished woman in no obvious distress. The heart was not enlarged. There was a soft systolic murmur at the apex. The blood pressure was 140 systolic, 80 diastolic. The lungs were clear. A visible swelling to the left of and below the umbilicus was caused by a firm, even, tender mass about the size of a baseball. There was an indefinite mass in the left upper quadrant, descending with respiration from beneath the costal margin. The liver edge was at the costal margin and appeared to be acutely tender. Considerable costovertebral tenderness was also elicited on the left. Vaginal examination showed a somewhat redundant anterior cervical lip. The cervix showed evidence of an old laceration, and there were many Nabothian cysts. The fundus was not definitely palpable, but the cervix moved on pressure beneath the abdominal mass. Rectal examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The blood showed a red-cell count of 3,700,000 with a hemoglobin of 75 per cent, and a white-cell count of 7800 with 75 per cent polymorphonuclears. The stools gave a positive reaction to the guaiac test. The serum protein was 6.2 gm. per 100 cc.

A pyelogram showed both kidneys to be normal. A barium enema passed to the midpoint of the transverse colon, where complete obstruction was met. The obstructing defect corresponded to the palpable mass, which was readily movable but always with the transverse colon. There were ten-

derness and spasm in the right lower quadrant.

The patient remained comfortable after admission, although the temperature varied between 98 and 100°F., and the pulse between 80 and 90. Later examination showed the firm, round, tender mass previously noted, but none of the other abdominal findings were corroborated. On the fifth day an abdominal operation was performed.

Differential Diagnosis

Dr. Robert R. Linton: We have in this case a forty-nine-year-old Canadian woman who was admitted to the hospital because of recurring attacks of unconsciousness, associated with severe chills on two occasions. The significance of these chills is rather difficult to determine, since we have no evidence that she had any fever with them, and the only temperature recordings we have are those of 98 and 100°F., after entry. The first attack of unconsciousness apparently was not associated with pain. The patient had five other attacks, however, that were apparently accompanied by severe abdominal pain. The note to the effect that she observed a lumpy protrusion of the abdomen, which moved up and down and disappeared when the pain ceased, is, I believe, of great importance in the diagnosis. It is rather strange that she apparently was well for a period beginning six months and ending seven weeks before admission, an interval of approximately four months. There is no question, however, that her symptoms became more marked in the last seven weeks before her admission, and her pains became more frequent. Of significance is the fact that the pain radiated from the umbilicus to the pubis and backward to the spine. Later she also observed that "heavy" food increased the pain, a thing which she had not noticed previously. In view of the x-ray findings, it seems extraordinary that her bowel habits remained unchanged. It is to be noted, however, that she is described as having been habitually constipated.

Physical examination is of interest because a mass was noted to the left and below the umbilicus. It was firm, even and tender, and about the size of a baseball. There was also a question of an indefinite mass in the left upper quadrant, descending with respiration. Pelvic examination was essentially negative. The fact that pressure beneath the abdominal mass produced movement of the cervix suggests to me that the abdominal mass was not connected to the uterus.

The laboratory studies are of importance in that they show a positive guaiac test in the stools. The blood counts show a secondary anemia, without leukocytosis.

There are a number of possibilities that enter my mind as explanations of these various symptoms and signs. In the first place, are we dealing with hyperinsulinism, that is, an adenoma of the islets of Langerhans, which of course could explain the symptoms of unconsciousness and also the severe chills? In answer to this, I believe the size of the abdominal mass and the fact that it was freely movable probably rule out this possibility.

Another condition that should be considered is that of cholelithiasis, with perforation of the gall bladder into the duodenum or colon and with a resulting obstruction of the bowel due to an impaction of a gallstone. I cannot rule out the diagnosis of cholelithiasis in this case, but it seems unlikely that the abdominal mass is due to an impacted gallstone in the intestines. In the first place, a gallstone usually becomes caught in the terminal ileum, and the fact that this patient's pain extended from the umbilicus to the pubis suggests that if she had intestinal obstruction, it was probably of the large bowel. In addition, she had no vomiting, a finding which is unusual in small-bowel obstruction.

Another possibility that enters my mind is an ovarian cyst with a twisted pedicle. The pelvic examination practically rules this out, and in addition the normal white-cell count hardly substantiates the diagnosis.

I think the most likely possibility is that this patient was suffering from some form of large-bowel obstruction. This is substantiated by the fact that she did have cramplike pains in her abdomen, which were chiefly felt below the umbilicus; this is characteristic of large-bowel pain. In addition, when she had the pain she noticed wavelike movements across her abdomen, which I interpret as intestinal peristalsis. The fact that she did not vomit suggests that her obstruction was in the large bowel and that it was only partial, which is also borne out by the fact that she was still having bowel movements. The positive guaiac reaction in her stools further bears out this diagnosis. It also indicates that we are probably dealing with a carcinoma which was ulcerating the bowel wall.

The x-ray studies give us additional information. A pyelogram of both kidneys showed that they were normal. The barium enema is of great significance in that it showed a complete obstruction of the transverse colon, which corresponded to the palpable mass in the abdomen. There was no evidence of displacement of the colon in the left upper quadrant, which probably rules out the presence of the indefinite mass in that region noted

on physical examination. The note made that after admission to the hospital, only the firm rounded mass was palpable also indicates this to be true.

In conclusion, my diagnosis in this case is carcinoma of the transverse colon, with almost complete obstruction. This does not explain satisfactorily to me the cause of the fainting spells and chills, but I do not see how it is possible to overlook the fact that by barium enema she had obstruction of the colon, or the fact that the mass felt in the abdomen was in direct relation to the point of obstruction. It is possible, I suppose, that the pains she suffered were severe enough to cause her to faint. I see no other way to explain them.

Clinical Diagnosis

Carcinoma of hepatic flexure.

Dr. Linton's Diagnosis

Carcinoma of transverse colon.

Anatomic Diagnosis

Lipoma of hepatic flexure.

Pathological Discussion

Dr. Tracy B. Mallory: Diagnostic opinion on the wards closely paralleled the line of reasoning that Dr. Linton has set forth. There was speculation about the curiously intermittent character of the obstructive symptoms, but the x-ray report seemed to clinch the diagnosis of carcinoma of the colon and the positive guaiac in the stools was cited as confirmatory evidence. The patient was therefore quickly prepared for operation and transferred to the surgical service.

On laparotomy Dr. Joe V. Meigs found a freely movable tumor in the hepatic flexure. The peritoneum was clear, but at one point the tumor seemed to have broken through the wall and to have marked the serosa. No doubt was felt that the lesion was carcinomatous, and a radical resection of the cecum, ascending colon and half the transverse colon was done with an anastomosis of the ileum to the transverse colon.

When the intestine was opened in the laboratory a pedunculated mass of tumor 6 by 4 by 4 cm. was discovered attached by a broad pedicle to the anterior wall of the hepatic flexure. The distal third of the tumor was greenish-black and obviously gangrenous. Beyond a sharp line of demarkation the remainder of the tumor was yellow and white, obviously consisting of a mixture of fatty and fibrous tissue. Microscopic examination confirmed the gross impression of a benign lipoma.

In retrospect, it is clear that the intermittent character of the obstruction was almost certainly due to attacks of intussusception, which are so frequent with polypoid tumors of the bowel. A lipoma would not, of course, be expected to produce a positive guaiac reaction, which was explained here by the partial gangrene of the tumor. Had the guaiac reaction been negative, the possibility of a benign tumor might have been more seriously considered.

The New England
Journal of Medicine

Formerly the
Boston Medical and Surgical Journal

Established in 1828

Owned by the Massachusetts Medical Society and Published under the Jurisdiction of the Committee on Publications

Official Organ of
The Massachusetts Medical Society
The New Hampshire Medical Society

Editorial Board

Joseph Garland, M.D.
William B. Breed, M.D.
George R. Minot, M.D.
Frank H. Lahey, M.D.
Shields Warren, M.D.
George L. Tobey, Jr., M.D.
C. Guy Lane, M.D.
William A. Rogers, M.D.
John P. Sutherland, M.D.
Stephen Rushmore, M.D.
Henry R. Viets, M.D.
Robert M. Green, M.D.
Charles C. Lund, M.D.
John F. Fulton, M.D.
A. Warren Stearns, M.D.
Dwight O'Hara, M.D.

Associate Editors

Thomas H. Lanman, M.D.
Donald Munro, M.D.
Henry Jackson, Jr., M.D.

Walter P. Bowers, M.D., Editor Emeritus
Robert N. Nye, M.D., Managing Editor
Clara D. Davies, Assistant Editor

Subscription Terms: $6.00 per year in advance, postage paid, for the United States; Canada, $7.04 per year; $8.52 per year for all foreign countries belonging to the Postal Union.

Material for early publication should be received not later than noon on Saturday.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to the *New England Journal of Medicine*, 8 Fenway, Boston, Massachusetts.

COMMUNITY FUND

This editorial is about money: how much or how little of it to give, and how to give it for a cause that is ours. This year the goal of the two hundred and twelve agencies covered by the Community Fund is $4,883,000. The campaign started January 18 and will continue until February 5, during which time the Physicians' Group is expected to raise $20,500. This figure seems small; yet it, like the larger one, represents an increase of 5 per cent over last year. Will physicians meet this challenge?

Perhaps we should examine the records of past campaigns to try to arrive at an answer. Last year for the first time the physicians did not quite meet their quota. The reason for this may not be single, but it is a fact that the number of them with incomes sufficient to allow them to give several hundreds of dollars is steadily declining. This year the number is even smaller. From this it seems clear that one way to offset this loss is to "broaden the base" of the giving; that is, more people must give a little more. We can possibly improve our status by examining the scale adopted for the contributors in industry, a copy of which is in the hands of each committeeman. In brief, the person earning an average weekly wage of twenty dollars is expected to contribute five dollars to the Community Fund. Very often he does contribute this, as do a great number of doctors' secretaries. Few of us are financially able to put down in cash what we know is our fair share in supporting this vast program. But one should remember that the participating agencies receive their allotments in periodic payments. Why not, then, give accordingly throughout the year? A physician who hands the committeeman a five-dollar bill could as easily give that much each month. In fact, one is urged to budget one's gift in any way one sees fit. Furthermore, it may be allotted to any one of the two hundred and twelve agencies listed on the designation sheet.

This yearly campaign is planned, not for the collection of money, but for the gathering of pledges. Let us pledge in proportion as we value our citizenship in a healthful, wholesome and stable community.

THE PRESIDENT'S BIRTHDAY

Infantile paralysis was first recognized as a clinical entity just one hundred years ago, and in 1916 our section of the country was first visited by a major epidemic of the scourge. Over thirteen years ago the Georgia Warm Springs Foundation was established, largely through the instrumentality of Franklin D. Roosevelt, himself a victim of the disease, and on September 23, 1937, the National Foundation for Infantile Paralysis was sponsored by President Roosevelt. On January 3, 1938, the foundation was incorporated as a nonprofit membership corporation under the laws of New York State.

Although the foundation has been functioning for over three years, its first annual medical meeting was held in New York City on November 7 and 8, 1940, and the report of this meeting has recently been released by the foundation's president, Basil O'Connor.* The foundation now functions in two fields: first, through its local activities as carried on by over a thousand chapters covering more than thirteen hundred counties in the United States, carrying aid to afflicted persons, and secondly, through its national activities, consisting largely of grants-in-aid to various institutions, covering investigations in five divisions — virus research, nutritional research, after-effects research, epidemiologic study and education.

Some of the activities of the foundation are listed by Mr. O'Connor in his report. Chemotherapy, as well as biotherapy, is being studied; $243,000 was granted to the field of virus research alone during the last three years. A grant of $37,500 was made for a clinical nutrition study of infectious diseases in human beings. Through the After-Effects Committee, $221,000 was granted to physiologists, chemists and orthopedic surgeons in laboratories and hospitals. Nearly $100,000 was expended in emergency medical services, public education and epidemiological studies. Since its organization, $1,554,000, or about 50 per cent of the funds raised, has been left with the chapters throughout the country for their local use.

The National Foundation for Infantile Paralysis is an amazing and thoroughly unique organization. Far from representing the financial generosity of a single man or a single family, or the studied investment of an industry, it really belongs to the common people who support it. It has been animated by the courage and zeal and enthusiasm of an individual, and to the country at large it must represent a triumph of unselfish devotion. It may well be ranked as a modern crusade.

The support of the foundation comes largely from the celebration of the President's birthday, which falls on January 30; a celebration that has been held annually since 1934, the proceeds of the first four years going to the Georgia Warm Springs Foundation. The conquest of the virus diseases, of which infantile paralysis is one of the four horsemen, is a major medical problem facing us today. The National Foundation for Infantile Paralysis has proved its earnestness, its integrity, its worthiness. It deserves universal support.

*Annual Report of the National Foundation for Infantile Paralysis, Inc. 54 pp. New York: National Foundation for Infantile Paralysis, Inc., 1940.

PSYCHIATRY AND THE SELECTIVE SERVICE SYSTEM

World War I showed clearly the importance of excluding army recruits who showed signs of nervous or mental instability and hence were liable to be a burden instead of an asset and later to cause great expense to the country on account of hospitalization and compensation. Although methods for carrying out the preliminary examination of draftees in the last war left much to be desired, results of great value were obtained. The Selective Service System is at present faced with this same problem.

For the purpose of co-ordinating the work of the physicians who are dealing with the problem of mental and nervous stability the Selective Service System has arranged seminars where examining physicians of the local draft boards and psychiatrists of the medical-advisory and induction boards can meet together, discuss the problems, and come to some agreement about methods, standards and terminology.

The first regional seminar was held in Washington, D. C., on January 2 and 3. It was opened by Director Dykstra and was addressed in an evening session by the Honorable Paul V. McNutt. The second regional seminar, arranged for the New England area, is to be held in Boston on January 30 and 31, and the program appears in this issue of the *Journal*. It is hoped that all examining physicians, medical-advisory-board psychiatrists and induction-board psychiatrists from the New England states who are able to attend will do so. Members of the medical profession who are interested in nervous and mental disorders will be welcome at the seminars, and attendance at the evening meeting should prove profitable to those leaders in community activity who are particularly con-

cerned with mental hygiene, social organization and welfare, and problems of individual adjustment.

MEDICAL EPONYM

Fröhlich's Syndrome

On October 12, 1901, Dr. Alfred Fröhlich (b. 1871), an associate of Nothnagel in the First Medical Clinic in Vienna, gave a demonstration before the Society of Psychiatry and Neurology in Vienna. His discussion, including a case report and references to the literature, was published in the *Wiener Klinische Rundschau* (15: 883–886, 906–908, 1901), under the title "Ein Fall von Tumor der Hypophysis cerebri ohne Akromegalie [A Case of Tumor of the Hypophysis Cerebri without Acromegaly]." A portion of the translation follows:

> I may repeat that in our case, along with the adiposity, other symptoms are present which make it seem apparent that these are to be regarded as trophic disturbances. Thus the scanty growth of hair, with loss of hair, the lack of hair in the axillae, the development of the breasts, the peculiar character of the pubis recalling the female genitals. . . . I have already spoken of the subjective sensation of chilliness and the dryness of the skin. Consequently there is present at least the suggestion of a myxedematous condition. . . . From these facts it may, therefore, be concluded that *in the presence of symptoms suggesting a tumor in the region of the hypophysis and in the absence of acromegalic symptoms, the existence of trophic disturbances elsewhere, such as rapidly developing obesity or changes in the skin resembling myxedema, points to the hypophysis itself as the origin of the new growth.*

R. W. B.

MASSACHUSETTS MEDICAL SOCIETY

COMMITTEE OF ARRANGEMENTS

The Committee of Arrangements calls attention to the fact that space is still available for scientific exhibits at the next annual meeting of the Society.

Physicians or organizations considering the presentation of such displays should notify Dr. George P. Sturgis, 330 Dartmouth Street, Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY*

Raymond S. Titus, M.D., *Secretary*
330 Dartmouth Street
Boston

Pregnancy in a Patient with Mitral Stenosis

Mrs. M. C. W., a twenty-four-year-old para III at term, was admitted to the hospital on June 25, 1935, not in labor, with a diagnosis of rheumatic heart disease, mitral stenosis and insufficiency, aortic insufficiency and cardiac decompensation.

The patient had had rheumatic fever in 1931, in the fifth month of her second pregnancy, and was confined to bed for about ten weeks. The pregnancy went to term, and during the last month the patient had dyspnea, orthopnea, palpitation and edema. Following a normal delivery in May, 1931, the patient was in such a poor condition that she was kept in bed in a hospital for forty-three weeks. She then returned home on limited exercise and digitalis. Her first pregnancy terminated in a normal delivery in June, 1929. Catamenia began at twelve, were regular with a twenty-eight-day cycle and lasted four days without pain. The last normal period began on October 5, 1934, making the expected date of confinement, July 12.

On her first visit to the prenatal clinic the patient was advised to go to the hospital. During the month prior to her admission she had numerous attacks of palpitation with dyspnea and orthopnea, without edema. Three weeks before admission the patient had an attack of palpitation lasting six hours. The patient was kept in bed during this time. There was no hemoptysis, cough, hoarseness, fainting spells, vertigo, scotomas or epigastric pain.

Physical examination at the time of admission showed a well-developed and well-nourished woman. The heart showed presystolic and systolic murmurs at the apex transmitted to the axilla. There was a diastolic murmur to the left of the sternum. The blood pressure was 160 systolic, 120 diastolic. The lungs were clear. There was edema of the ankles. The fundus was enlarged to a size consistent with the period of amenorrhea. The vertex was presenting in the pelvic brim, in an LOA position, and the fetal heart was audible.

Three days after admission the membranes were ruptured artificially. Following this, the patient had a few slight back pains. At midnight she was having an occasional contraction, but the cervix showed no change. At 1:12 a.m. 1 minim of Thymophysin was given, and the patient started in good labor. The fetal heart at this time was somewhat rapid and irregular. When only a rim of cervix remained, drop-ether anesthesia, with oxygen, was started. The patient did not look well at this time, although the pulse was 80 and of good quality; and she soon became cold and clammy. The fetal heart could not be heard. Induction of anesthesia was very slow, deliberate and careful. Forceps were applied, and the head was delivered without traction. The baby was in very poor condition and required a great deal of resuscitation. It finally began to breathe fairly well but in a jerky manner.

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

The mother's condition was satisfactory immediately following delivery, and she made an uneventful convalescence. The baby, however, died the day after delivery, and autopsy showed hemorrhage around the adrenal gland. The diagnosis was believed to be hemorrhagic disease of the newborn. The mother was discharged on July 21, obstetrically well with medical complications.

Comment. This patient was very severely ill. The method of delivery may well be criticized. The dictum that a cardiac patient should not have labor induced at any time for any reason is sound, and there was no very good reason for giving it up in this case.

The patient, having had cardiac decompensation, is classified as a Class 1A cardiac. In the first place, she should not have become pregnant; in the second place, she should have had her pregnancy terminated early, had she been seen at that time.

When first seen in the clinic, she showed early signs of decompensation. A much longer period of hospitalization before delivery would have been advisable.

When the patient again became pregnant, a therapeutic abortion was performed.

COMMITTEE ON INDUSTRIAL HEALTH

Questions and Answers

Q. In one of our departments we are contemplating the installation of a large number of fluorescent lights. Some rumors are going around among the employees that exposure to these lights has an effect on the ovaries and may even cause sterility. Could you provide me with any information on this subject?

A. There is no more reason to anticipate harmful effects from this light than from other illuminants, such as tungsten filament lamps and Cooper-Hewitt mercury arcs.

Q. I am consultant to a plant in which large quantities of benzol are used in the manufacture of certain industrial chemicals. This benzol is normally kept in an entirely enclosed system, but there is some unavoidable inhalation of benzol vapor by maintenance and repair workers. There are reports in the literature of fatal cases of benzol poisoning in workers with very low-grade exposure to benzol. What steps should I take to make sure that no such cases occur?

A. Frequent examination should be made of those exposed to any concentration of benzol. Any abnormality in the blood picture should be regarded with suspicion. Tests for sulfate excretion in the urine should also be made, according to the method of Yant, Schrenk, Sayers or others.

Q. I am plant physician for a small concern in which I suspect several men are exposed to harmful quantities of lead fumes. Where can I have the air analyzed to see how much lead is present, and where can I have urine samples examined to determine the amount of lead?

A. Your compensation-insurance carrier will probably do this for you; if not, the matter should be referred to your state department of industrial hygiene, provided it is equipped to make such examinations.

Q. Assuming that all precautions have been taken to prevent lead absorption, what method of examination should be used periodically on exposed employees?

A. In cases of moderate exposure, a routine examination of blood smears for stippling, a general physical examination and an examination of the urine for lead should be conducted quarterly.

Q. What is a safe procedure to use in the re-employment of a person with arrested tuberculosis?

A. Assuming that the tuberculosis has been arrested, the following conditions should hold on re-employment: careful, frequent check by x-ray and sputum examination; no exposure to dust; no strenuous exertion, particularly that involving stretching motions; adequate ventilation; and adequate rest.

Q. When should shop workers exposed to dust wear respirators?

A. Respirators should be worn when either siliceous or non-siliceous dust is present in large amounts. They should be used, however, as adjuncts to exhaust methods of dust removal, rather than as substitutes. Respirators are particularly necessary when the dust contains free silica (SiO_2) in amounts exceeding 1 per cent, which cannot be controlled by engineering methods.

Q. Please send me a list of simple approved respirators which can be used by workers in a moderately dusty atmosphere. The dusts are not specifically harmful, being of a vegetable nature.

A. Specific dust problems should be discussed with your state department of industrial hygiene,

where full and complete information as to the various types of respirators may be obtained.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning January 26:

MIDDLESEX EAST

Tuesday, January 28, at 4:15 p.m., at the Melrose Hospital, Melrose. Pediatric Case Discussions. Instructor: R. Cannon Eley. Walter H. Flanders, *Chairman*.

MIDDLESEX SOUTH

Tuesday, January 28, at 4:00 p.m., at the Cambridge Hospital, Mt. Auburn Street, Cambridge. Diet and Vitamins in Surgery. Instructor: Charles C. Lund. Dudley Merrill, *Chairman*.

NORFOLK

Thursday, January 30, at 8:30 p.m., at the Norwood Hospital, Norwood. Technic and Treatment of Primary, Secondary and Tertiary Syphilis. Instructor: C. Guy Lane. Hugo B. C. Riemer, *Chairman*.

NORFOLK SOUTH

Monday, January 27, at 8:30 p.m., at the Quincy City Hospital, Quincy. Recent Advances in Medical Therapeutics. Instructor: Charles A. Janeway. David L. Belding, *Chairman*.

SUFFOLK

Thursday, January 30, at 4:30 p.m., in John Ware Hall, Boston Medical Library. Chemotherapy in the Treatment of Gonococcal Infection. Instructor: Oscar F. Cox. Reginald Fitz, *Chairman*.

DEATHS

DAVIS — Charles H. Davis, M.D., of South Hamilton, died January 15. He was in his sixty-ninth year.

Born in Somerville, he attended Harvard University and received his degree from Harvard Medical School in 1899. He practiced in Beverly for four years, one of which he served as city physician. He went to South Hamilton in 1905.

Dr. Davis was a fellow of the Massachusetts Medical Society and of the American Medical Association.

His widow, a daughter and two sons survive him.

DECKER — John J. Decker, M.D., of Sioux City, Iowa, died December 18. He was in his thirty-seventh year.

He received his degree from the University of Wisconsin Medical School in 1931 and interned for one year at the Bell Memorial Hospital, Kansas City, Kansas. From 1933 to 1938 he was assistant superintendent of the Lakeville State Sanatorium in Middleboro. Dr. Decker took a general surgery internship at the Carney Hospital from 1938 to 1939. For the fourteen months before his death, he was in general practice and surgery in Sioux City, Iowa.

Dr. Decker was a fellow of the Massachusetts Medical Society and of the American Medical Association.

His widow and a daughter survive him.

HENRY — John G. Henry, M.D., of Winchendon, died January 18. He was in his eighty-fourth year.

He received his degree from Dartmouth Medical School in 1881. At the time of his death he was president of the Millers River Hospital, Winchendon. Dr. Henry was a fellow of the Massachusetts Medical Society and the American Medical Association. He also held memberships in the New England Obstetrical and Gynecological Society and the American College of Surgeons.

HUBBARD — Osmon H. Hubbard, M.D., of Gilsum, New Hampshire, died January 5. He was in his eightieth year.

Dr. Hubbard received his degree from McGill University Faculty of Medicine in 1888. He was a member of the Massachusetts Medical Society and the American Medical Association.

HUTCHINGS — J. Henry Hutchings, M.D., of Woburn, died January 12. He was in his seventy-ninth year.

He attended Tufts College and received his degree from New York University Medical College in 1887. He interned at Charing Cross Hospital, London, and studied in Vienna before returning to begin practice here.

Dr. Hutchings was a fellow of the Massachusetts Medical Society and the American Medical Association.

His widow survives him.

KRAMER — Florence Kramer, M.D., of Lynn, died at Miami Beach, Florida, January 15. She was in her fifty-eighth year.

Born in New York City, she received her degree from Loyola University School of Medicine in 1918 and first practiced surgery in the coal-mining district of West Virginia.

She was a member of the Massachusetts Medical Society and the American Medical Association and secretary of the North Shore Medical Society.

Her widower, Dr. Maurice Reingold, survives her.

MURPHY — Edward F. Murphy, M.D., of Jamaica Plain, died January 15. He was in his sixty-fifth year.

Born in St. John, New Brunswick, he received his degree from McGill University Faculty of Medicine in 1899 and was a member of the staff of the Royal Victoria Hospital, Montreal. Since 1901 he had been in general practice in Boston, and during World War I was a captain in the medical corps.

Dr. Murphy was a fellow of the Massachusetts Medical Society and of the American Medical Association. He was a former staff member of St. Elizabeth's Hospital, and at the time of his death was president of the Forest Hills Hospital. He had been chief medical examiner for the law department of the City of Boston for the past ten years and was a member of the Massachusetts Society for Examining Physicians.

His widow, a daughter, three brothers and two sisters survive him.

WALTON — George L. Walton, M.D., of Boston, died January 17. He was in his eighty-eighth year.

Born in Lawrence, he attended Williston Seminary and Harvard University, and received his degree from the Harvard Medical School in 1880. The following three years were spent studying in Europe as a Parker Fellow in the Study of Neurology. From 1900 to 1906 he was clinical instructor in the Department of Diseases of the Nervous System at Harvard Medical School. Dr. Walton had also served as physician and consulting physician to

the Neurological Department of the Massachusetts General Hospital.

He was a member of the Massachusetts Medical Society, the American Medical Association, the American Neurological Association and the Boston Society for Psychiatry and Neurology.

CORRESPONDENCE

MASSACHUSETTS STATE GUARD

A number of doctors are needed for duty as medical officers with the new Massachusetts State Guard which is now being formed. This volunteer organization will function in place of the Massachusetts National Guard, which is being inducted into federal service. It will be trained to cope with any emergency situation that might occur within the Commonwealth and which might overtax the capacities of civilian organizations.

A doctor, after receiving his commission, at the outset will have to devote a certain number of evenings to the examination of recruits, and thereafter will be expected to give one evening a week to drill, training and other routine duties. Full-time service will be required only in the event of some emergency, and will be limited to within the State.

The requirements of the physical examination are not strict. Previous military experience is desirable but not a necessary prerequisite. It is not expected that this duty will interfere materially with one's private practice. Any interested medical men will please communicate promptly with the undersigned, stating briefly their age, qualifications, and previous military experience, if any. Outside the Greater Boston area, there is need for one or more men in or near Brockton, Fall River, Framingham, Holyoke, Lawrence, Lynn, New Bedford, Pittsfield, Plymouth, Salem, Springfield and Worcester.

RICHARD H. MILLER, M.D., *Chief Surgeon.*
264 Beacon Street,
Boston.

DEPRIVATION OF LICENSE

To the Editor: At the meeting of the Board of Registration in Medicine held January 9, the Board canceled the registration as a practitioner of medicine in this commonwealth and revoked the certificate of registration of Dr. Daniel Nyman, 9 Jason Street, Arlington, Massachusetts, because of gross professional misconduct in connection with a case of abortion.

STEPHEN RUSHMORE, M.D., *Secretary,*
Board of Registration in Medicine.

State House,
Boston.

NOTICES

ANNOUNCEMENT

GERALD I. LICHTER, M.D., announces the removal of his office from the Boston City Hospital, Boston, to 1421 Main Street, Springfield.

BOSTON TUBERCULOSIS ASSOCIATION

The Boston Tuberculosis Association is holding its annual meeting at the Women's Republican Club, 46 Beacon Street, Boston, on Friday, January 31, at 4:30 p.m.

The meeting will be followed by a dinner at 6:15 p.m., attended by members and guests of the Southern Middlesex Health Association, Boston Tuberculosis Association, Norfolk County Health Association, Newton Family Service Bureau, Cambridge Tuberculosis and Health Association, Essex County Health Association, Lawrence Tuberculosis League, Lowell Tuberculosis Association, Lynn Tuberculosis League, Malden Tuberculosis and Health Association, Salem Association for the Prevention of Tuberculosis, Southwestern Middlesex Public Health Association, Southern Worcester County Health Association, Massachusetts Tuberculosis League and the Trudeau Society of Boston. The after-dinner speaker will be Dr. Bruce H. Douglas, tuberculosis controller, Detroit Department of Health, whose subject is "Present-Day Problems in the Control of Tuberculosis."

MASSACHUSETTS GENERAL HOSPITAL

A meeting of the Hospital Research Council will be held in the White Auditorium of the Massachusetts General Hospital on Tuesday, January 28, at 5:00 p.m.

PROGRAM

Nutritional Factors in Obstructive Jaundice in Relation to Treatment. Dr. John D. Stewart and Miss G. Margaret Rourke.

Diagnostic Value of Synovial Fluid Analyses. Drs. Marian W. Ropes, Howard C. Coggeshall and Walter Bauer.

A Classification of the Various Types of Male Eunuchoidism from an Endocrine Point of View. Drs. Fuller Albright, Anne P. Forbes, R. Bretney Miller and Russell Frazer.

Dr. A. L. Watkins invites all who are interested to visit the Department of Physical Therapy at 4:30 p.m., just before the meeting.

BOSTON DOCTORS' SYMPHONY ORCHESTRA

The Boston Doctors' Symphony Orchestra will rehearse under Alexander Thiede, formerly concertmaster of the Cleveland Symphony Orchestra, every Thursday at 8:30 p.m. Those interested in becoming members should communicate with Dr. Julius Loman, Pelham Hall Hotel, Brookline (BEA 2430).

BOSTON MEDICAL HISTORY CLUB

There will be a meeting of the Boston Medical History Club on Monday, January 27, at the Boston Medical Library, 8 Fenway, Boston, at 8:15 p.m. Dr. Harold H. Plough, Rufus Tyler Lincoln Professor of Biology, Amherst College, will speak on "Human Genetics in Relation to Medicine."

All interested persons are cordially invited to attend.

GREATER BOSTON MEDICAL SOCIETY

There will be a meeting of the Greater Boston Medical Society on Tuesday, February 4, in the auditorium of the Beth Israel Hospital at 8:15 p.m. Dr. David I. Macht, of Baltimore, Maryland, will speak on "Experimental and Therapeutic Researches on Snake Venoms." Discussion will follow by Drs. Hyman Morrison and Harry Blotner.

MASSACHUSETTS PSYCHIATRIC SOCIETY

There will be a meeting of the Massachusetts Psychiatric Society at the Boston Psychopathic Hospital on Friday, January 31, at 8 p.m.

PROGRAM

The Evaluation of Intellectual Deterioration. Dr. David Shakow.
Procedures for the Study of Personality Through Educed Phantasies. Dr. S. Rosenzweig.
Some Technics for the Measurement of Psychophysiologic Function. Dr. E. H. Rodnick.

TRUDEAU SOCIETY OF BOSTON

There will be a meeting of the Trudeau Society of Boston at the Beth Israel Hospital on Friday, January 31, at 8 p.m. Dr. Bruce H. Douglas, of Detroit, Michigan, will speak, his subject being "Methods in Tuberculosis Case Finding."

Physicians and students are cordially invited.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held on Tuesday, January 28, in the amphitheater of the Peter Bent Brigham Hospital at 8:15 p.m. Dr. Elliott C. Cutler will preside.

PROGRAM

Presentation of cases.
Carcinoma of the Pancreas. Dr. Frank Glenn, assistant professor of surgery, Cornell University Medical College.

JEWISH MEMORIAL HOSPITAL

There will be a staff meeting of the Jewish Memorial Hospital on Wednesday, January 29, in the hospital auditorium, 45 Townsend Street, Roxbury, at 8:30 p.m.

PROGRAM

Recent Advances in the Treatment of Mental Diseases. Dr. Abraham Myerson.
Collation.

All interested physicians are cordially invited to attend.

CONSULTATION CLINIC FOR CRIPPLED CHILDREN IN MASSACHUSETTS, UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

CLINIC	DATE	CLINIC CONSULTANT
Salem	February 3	Harold C. Bean
Haverhill	February 5	William T. Green
Lowell	February 7	Albert H. Brewster
Gardner	February 11	Mark H. Rogers
Brockton	February 13	George W. Van Gorder
Pittsfield	February 17	Frank A. Slowick
Northampton	February 19	Garry deN. Hough, Jr.
Fall River	February 24	Eugene A. McCarthy
Hyannis	February 25	Paul L. Norton
Worcester	February 28	John W. O'Meara

NORFOLK DISTRICT MEDICAL SOCIETY

A regular meeting of the Norfolk District Medical Society will be held at the Carney Hospital, South Boston, on Tuesday, January 28, at 8:30 p.m.

PROGRAM

Business.
Papers and case presentations by the hospital staff.
Discussion.
Collation.

NEW ENGLAND PEDIATRIC SOCIETY

There will be a meeting of the New England Pediatric Society on Wednesday, January 29. The clinical presentation will be held in the amphitheater, Joseph H. Pratt Diagnostic Hospital, and all other events at Longwood Towers, Brookline.

PROGRAM

4:00 Clinical meeting, Boston Floating Hospital. Dr. Elmer W. Barron and his associates.
6:30 Refreshments.
7:00 Dinner.
8:00 Annual meeting of the society.
Election of officers.
Report of treasurer.
8:30 Pathologic Aspects of Adiposity. Dr. Sidney Farber.

SELECTIVE SERVICE SYSTEM: SEMINAR ON PSYCHIATRIC PROBLEMS

A seminar on psychiatric problems, arranged for the benefit of the examining physicians of the local draft boards and the psychiatrists of the medical advisory and induction boards, will be held in Boston on January 30 and 31. Dr. Karl M. Bowman, of New York City, will be the presiding chairman. The program is as follows:

JANUARY 30

Morning Session, 10:30 a.m., Boston Medical Library

Introduction. Brigadier General Edgar C. Erickson.
Remarks on the Medical Work of the Selective Service System. Donald E. Currier, M.D.
Psychiatric Factors in the Medical Examination. Joseph H. Pratt, M.D., professor of clinical medicine, Tufts College Medical School.
Military Psychiatry and the Selective Service System. Lieutenant Colonel W. C. Porter.
Psychiatric Experience of the Veterans Administration. Martin Cooley, M.D.

Afternoon Session, 2:00 p.m., Boston Medical Library

Practical Psychiatry. Harry S. Sullivan, M.D.
Informal discussion.
Synthesis of the discussion. Dr. Sullivan.

Evening Session, 8:30 p.m., Hotel Statler

Dr. W. G. Phippen, president, Massachusetts Medical Society, chairman

National Defense and Selective Service. Robert T. Bushnell, attorney general of Massachusetts.
What the Medical Profession Expects from Psychiatry. Lieutenant Colonel Elliott C. Cutler, M.R.C.
Selective Service and Psychiatric Issues. C. Macfie Campbell, M.D., medical director, Boston Psychopathic Hospital.

JANUARY 31

(Each presentation will be followed by informal discussion by the panel of psychiatrists from the medical advisory boards and the induction boards.)

Morning Session, 9:30 a.m., Boston Medical Library

Peculiar Personalities: Mood disorders and psychopathic personalities. Karl M. Bowman, M.D., director of psychiatry, Bellevue Hospital, New York City.

Disorders with Structural Features: Mental defect and deficiency, posttraumatic encephalopathy, postencephalitic changes, epilepsy and related states, and conditions associated with somatic disease and injury. Harry C. Solomon, M.D., associate professor of psychiatry, Harvard Medical School.

Psychosomatic Disorders. Abraham Myerson, M.D., clinical professor of psychiatry, Harvard Medical School.

Afternoon Session, 2:00 p.m., Boston Medical Library

The Psychoneuroses and Malingering. Francis H. Sleeper, M.D., director of hospital inspection, Massachusetts Department of Mental Health.

Schizophrenic and Related Personalities. Douglas A. Thom, M.D., professor of psychiatry, Tufts College Medical School.

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING SUNDAY, JANUARY 26

SUNDAY, JANUARY 26

†4 p.m. Medical Aids to Justice. Dr. Alan R. Moritz. Free public lecture. Harvard Medical School, Building D.

†4 p.m. Orthopedics and the Layman. Dr. Robert H. Morris. Public health lecture. Cambridge Hospital, Margaret Jewett Hall.

MONDAY, JANUARY 27

12:15–1:15 p.m. Clinicopathological conference. Peter Bent Brigham Hospital amphitheater.

*8:15 p.m. New England Heart Association. Peter Bent Brigham Hospital.

*8:15 p.m. Human Genetics in Relation to Medicine. Dr. Harold H. Plough. Boston Medical History Club. Boston Medical Library, 8 Fenway.

TUESDAY, JANUARY 28

*9–10 a.m. Clinic on Tumors of the Breast. Dr. W. M. Shedden. Joseph H. Pratt Diagnostic Hospital.

12:15–1:15 p.m. Clinicoroentgenological conference. Peter Bent Brigham Hospital amphitheater.

5 p.m. Hospital Research Council. Massachusetts General Hospital, White auditorium.

8:15 p.m. Harvard Medical Society. Peter Bent Brigham Hospital amphitheater.

WEDNESDAY, JANUARY 29

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.

*12 m. Clinicopathological conference. Children's Hospital.

*2–4 p.m. Endocrine Disorders. Drs. R. Loeb and E. C. Cutler. Peter Bent Brigham Hospital.

4–8:30 p.m. New England Pediatric Society. Joseph H. Pratt Diagnostic Hospital and Longwood Towers, Brookline.

*8:30 p.m. Jewish Memorial Hospital, 45 Townsend Street, Roxbury.

THURSDAY, JANUARY 30

*8:30 a.m. Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital, at the Peter Bent Brigham Hospital.

*9–10 a.m. Sulfathiazole in Gonococcal Infections. Dr. O. F. Cox. Joseph H. Pratt Diagnostic Hospital.

Selective Service System Seminar. Boston Medical Library, 8 Fenway.

*5 p.m. Vitamin K: Its general significance in biochemistry, and its role in human pathology and its application in therapeutics. Dr. Henrik Dam. Cutter Lecture on Preventive Medicine. Harvard Medical School, amphitheater of Building E.

FRIDAY, JANUARY 31

*9–10 a.m. Clinicopathological conference. Drs. J. C. Aub and H. E. MacMahon. Joseph H. Pratt Diagnostic Hospital.

Selective Service System Seminar. Boston Medical Library, 8 Fenway.

4:30 p.m. Boston Tuberculosis Association. Women's Republican Club, 46 Beacon Street, Boston.

*8 p.m. Methods in Tuberculosis Case Finding. Dr. Bruce H. Douglas. Trudeau Society of Boston. Beth Israel Hospital.

8 p.m. Massachusetts Psychiatric Society. Boston Psychopathic Hospital.

*Open to the medical profession.
†Open to the public.

FEBRUARY 4 — Greater Boston Medical Society. Page 176.

FEBRUARY 5 — Wachusett Medical Society. Page 135, issue of January 16.

FEBRUARY 12 — New England Dermatological Society. Page 134, issue of January 16.

FEBRUARY 13 — Pentucket Association of Physicians. Page 263, issue of August 15.

FEBRUARY 20–22 — American Orthopsychiatric Association, Inc. Page 999, issue of December 12.

MARCH 8 — American Board of Ophthalmology. Page 201, issue of August 1.

MARCH 12–14 — New England Hospital Assembly. Hotel Statler, Boston.

MARCH 21–22 — New York University College of Medicine, Alumni Day. Page 135, issue of January 16.

APRIL 21–25 — American College of Physicians. Page 1065, issue of June 20.

MAY 21, 22 — Massachusetts Medical Society, Boston.

JUNE 2–6 — American Medical Association. Cleveland, Ohio.

OCTOBER 14–17 — American Public Health Association. Page 135, issue of January 16.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH

FEBRUARY 5 — Gastric and Duodenal Ulcer: Diagnosis and treatment. Dr. Arthur Allen. Lynn Hospital.

MARCH 5 — X-ray in Heart Disease. Dr. Merrill C. Sosman. Essex Sanatorium, Middleton.

APRIL 2 — Pediatric Problems in General Practice. Dr. Joseph Garland. Addison Gilbert Hospital, Gloucester.

MAY 14 — Relation of the Doctor to the Law. Mr. Leland Powers. New Ocean House, Swampscott.

FRANKLIN

MARCH 11.

MAY 13.

Meetings will be held at 11 a.m. at the Franklin County Hospital, Greenfield.

NORFOLK

JANUARY 28 — Carney Hospital. Page 177.

FEBRUARY 25 — Medicolegal meeting. 8:30 p.m. Hotel Puritan, Boston.

MARCH 25 — To be announced.

MAY 8 — Censors' meeting. Hotel Puritan.

SUFFOLK

JANUARY 29 — Page 604, issue of October 10.

APRIL 30 — Page 604, issue of October 10.

WORCESTER

FEBRUARY 12 — Worcester State Hospital, Worcester.

MARCH 12 — Memorial Hospital, Worcester.

APRIL 9 — Hahnemann Hospital, Worcester.

Supper at 6:30 p.m. followed by a business meeting and scientific program.

BOOK REVIEW

A Method of Anatomy, Descriptive and Deductive. By J. C. Boileau Grant, M.C., M.B., Ch.B., F.R.C.S. (Edin.). Second edition. 4°, cloth, 794 pp., with 651 illustrations. Baltimore: Williams & Wilkins Company, 1940. $6.00.

This second edition, much improved by new textual discussions and by one hundred additional illustrations, should make a strong appeal to students. The author presents his subject in a stimulating manner, well calculated to stir the imagination and the interest of his readers. Mutual relations of facts and their correlation with clinical data constitute an important aspect of the book. Those who are familiar with the first edition will want to own a copy of the new one.

Vol. 19